Very truly Yours
William E Jurden

WAY-MARKS

OF

TWO ETERNITIES:

A LIBRARY OF SCIENCE,

BEING A HISTORY OF THE CREATION, ORIGIN, AND EVOLUTIONS OF PLANETS AND THEIR INHABITANTS; CREATION AND HISTORY OF THE EARTH; ORIGIN OF LIFE AND OF THE SPECIES; DESCENT OF MAN; PRE-ADAMIC RACES; THE WORLD BEFORE THE DELUGE.

FUTURE of MAN, of the EARTH, and of the SUN.

LIFE AND DEATH,

THE HERE AND THE HEREAFTER.

Facts from Nature, Novel as a Fairy Tale, of Stupendous Importance to the Human Race.

BASED ON ESTABLISHED DATA

Of Natural Philosophy, Astronomy, Geology, Biology, Anthropology, Archæology, Zoölogy, Embryology, Metamorphology, Geometry, Chemistry, Botany, Physiognomy, Surgery, Sociology, Psychology, Traditions, and Religions of the World.

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By WILLIAM E. JURDEN, A. M., M. D.

"Produce your cause; bring forth your strong reasons; show us what shall happen; show the former things, what they be, that we may consider them, show the things that are to come hereafter. Magnify the law, and make it honorable."—Isaiah.

FINELY ILLUSTRATED.

PUBLISHED BY
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1891

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TO

WIFE AND DAUGHTER,

ALICE AND PHŒBE JURDEN,

THIS VOLUME IS AFFECTIONATELY

DEDICATED.

PREFACE.

This book is an attempt to explain the origin of life and of man on our globe, to give a history of the world and of the universe from its beginning, and to lift the vail which hides the future. It will attempt to prove the following new and original propositions : —

1. That worlds have periods of growth, development, and decay. In a more magnificent sense, their beginnings and histories correspond to the beginnings and developments of individual human life : Inception — Embryos — Birth — Childhood — Manhood — Old Age, and Death.

2. To know the series of changes in the life of a human being, is to know the natural history of all human beings ; to know the evolutions in the life of one planet, is to know the natural history of all planets. And in like manner as we study human life in all stages of its development, so, also, we look out into the heavens, and behold worlds in all stages of their natural existence.

3. Comets are planets in embryo ; like the embryos of all life, they do not all reach maturity, being often precipitated upon planets, or drawn into the vortex of suns. They wander in space, carried by the ether currents imparted by the rotation of great suns, until their consuming fires have condensed for them a nucleus, rock-encrusted, and a surrounding atmospheric envelope, upon which a sun's rays can act, imparting axial and orbital

motion, when they appear in a changed aspect, new-born babes among the planets.

4. The earth was once a comet,—a fiery, phosphorescent, burning chaos of matter, wandering in space. The comet earth, like the inception of all comets, was drawn by the sun out of the "formless void," "dark waters," distant nebula of space. The inception of our world was the flame imparted by the rays of a maternal sun, as when carbon gas is touched with fire. "*God said let there be light, and there was light.*"

5. The first day, or period, in the history of the earth as a planet, is now being re-enacted in the planet Neptune, the most remote planet in the solar system, babe of the sun, youngest sister of the earth. Neptune still possesses many of the characteristics of a comet. Stars can be seen through her in all parts save the central nucleus. Infinite ages ago, when the earth was young, in the first day of her history, she occupied the place of Neptune, and differed not essentially from her; the central core of fire had become encrusted with red glowing rock, while a dark atmosphere of dense vapors, ten thousand miles in depth, enshrouded the world in darkness; thus "*God divided the light from the darkness.*"

6. The second day or period in the world's history is now being repeated by the planet Uranus. Oxygen has found its equivalent in hydrogen, creating watery vapors, and from the depths of black sky is being poured out waters in one universal shower, while an intervening purer atmosphere divides "*the waters which are under the firmament from the waters which are above the firmament.*"

7. The third day or geologic age in the history of the world, is now represented by the planet Saturn. The accelerating rapidity of axial rotation has caught up the

superabundant cloud-banks of cosmic matter forming gigantic external rings. Beneath the mighty depths of dark atmosphere, mountains of recently upheaved rock lift their bosoms above the waters. In this manner God said, "*Let the waters under the heavens be gathered together unto one place, and let the dry land appear; and it was so.*"

8. The fourth day in the world's history, as at the close of each preceding day, the earth assumed a place nearer the sun, and occupied the present position of the planet Jupiter. Under the rays of a closer and brighter sun, vegetation, which began in low forms on the third day, now covered the landscape, as if by magic, feeding upon and storing away into immense beds of coal the dark envelope of carbon clouds, letting in for the first time upon the surface of the earth the light of sun, moon, and stars, "*for signs and for seasons and for days and for years.*"

9. The fifth period or day in the history of the world, our planet occupied the place of the asteroids. Stimulated by the life-giving rays of a still nearer and brighter sun, the fishes and low forms of life, which since the third day had filled the waters, now evolved higher and amphibious forms. "*The waters brought forth abundantly the moving creature,*" winged fowl appeared in the open firmament of heaven, the Age of Reptiles had come, and "*fowl multiplied on the earth.*"

10. The sixth day or epoch in the history of the earth, she occupied the place and represented a similar appearance and aspect to the planet Mars. A nearer sun shone down with a new vitalizing power, transforming all the types of former life; the human foot and hand, the human form and a dim miniature of the human brain,

made their advent in the world; monkeys, apes, orangs, chimpanzees, and numerous human caricatures made their appearance, crossing, propagating, and rising higher; while out from the progressing and evolving cosmos of material, "*God said let us make man in our image.*"

11. The seventh day began with the Noachian Deluge, when the earth changed its polar axis, and assumed its present position in the heavens, a position still nearer the sun, bringing with it the calm stability of human history, and a period of quiescence from the war and turmoil of elements, by the activities of which the world had been evolved. "*And on the seventh day God rested from his labors.*"

12. The eighth day or era in the history of the world, yet to come, the earth will occupy the position and place of the planet Venus. Then will come a new unfolding. Man will become a being grander and better, the race will climb up to a homogeneous unity, all men will be of one heart and one mind, the millennium will have come, mankind will have beaten their "*swords into plowshares and their spears into pruning hooks.*" In that new and more genial clime, when the earth shall have taken a position nearer the sun, "*the light of the moon shall be as the light of the sun, and the light of the sun shall be seven-fold in the day the Lord bindeth up the breach of his people, and healeth the stroke of their wound.*"

13. The ninth day and age in the history of the world, she will assume the place of the planet Mercury, near the sun, at last a laden world of death and rock, the tomb of all preceding ages, sarcophagus, shroud, pall, and bier of all the past, waiting for the resurrection promised by all the priests, "*ripe for the harvest, and red for the winepress.*"

14. Then the earth shall plunge into the seething fires of a central sun, "*the elements shall melt with fervent heat*," "*the earth shall be broken down; it shall be clean dissolved.*" Every sleeping energy, every physical and mental force hid away in earth and rock, shall spring to life; every moral and intellectual principle, the camera plates of life and character, dust, with its engraven images of thought and love slumbering in the bosom of the world, shall be called up; the great charnel house of the earth itself shall spring again to life, "*the dead, small and great, shall stand before God.*"

15. Such has been and will be the history of the world, and such has been and will be the history of every planet, and of every embryonic comet. They all represent stages of development in the life of planets. To know the past and future of the earth is to read the past and future of all the worlds in the infinite expanse of heaven.

16. This book will prove that the earth has revolved on other polar centers, with other tropics and other regions of ice-covered arctics; that the change to her present position was sudden, overtaking the elephants of tropical Siberia in a single night, and preserving them in ice with the blast of frigid cold until this day, while glacial ages followed in the new tropics, by the melting of the ice of former poles. Such is the history of Utah and the ice origin of her salt seas.

17. Science proves, and the Bible teaches, that man has inhabited this globe for a period of no less than five hundred thousand years; that there have been four distinct human epochs, separated by mighty convulsions or chasms, which have befallen the earth and devastated its life. The last human epoch we will call the Age of Let-

ters, comprising the period of all hieroglyphics and written symbols, which embraces the Age of Iron; prior to which time there was a distinct human Age of Bronze, back of which a distinct human Age of Stone, and still earlier, the half-human Age of Cave-dwellers.

18. This work will be an arcanum of nature in its varied departments, creating a new science out of the sciences, forming of classified facts a geometric whole. The human inception, the human embryo, antenatal influences, and the influences of society, will be embraced in their proper places. A new light will be thrown on existence itself. Human thought in its relation to divine thought, life and death, will be contemplated.

19. The book will prove man an immortal being, and in gates ajar show an inkling of a glory beyond the stars.

THE AUTHOR.

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INTRODUCTION

AND PLAN OF THIS WORK.

Reason's enthroned monument of majesty,
Column of divinest essence, Eternal Truth;
On which, in varied degrees, the heart is founded,
Assist me; not for sordid pride or low ambition,
In my self-imposed task of no common theme;
Daring lofty heights, to survey and contemplate
Eternity's page, and the Infinite plan.

Now lost my soul a bird with wings outstretched wide;
Soaring, circling, dreaming, in immeasurable space;
Delving into deep, unknown, unfathomed seas;
Of times that have been, of times and things to be;
Sing; a thousand strings engage in song of science;
The strain unfolding, tell the story of every star;
Ring out the world's eternal history; fill the page
Of each mighty age, since order from chaos began.

Sing a perpetual creation, eternal forces;
Forests of growing, changing, dissolving worlds.
Explore the silent, vast abyss of nascent space,
Where shades brood nebula, and nebula fires
Plunging athwart the sky. Ride Orphean comets
Through succeeding changes, for cycles of ages,
To rounded, chaotic, gaseous planets;
Globes of flame, robed in dark mantles of vapor,
Revolving as they oscillate around the sun,
Like Encke's comet, now changing to a world;
Or like Neptune, full-fledged in swaddling clothes;

Last born of planets from fire and wandering space.
Commencing her course in the vanguard of worlds;
Treading, each, slow circling paths towards the sun;
Progressing, as they nestle closer to his bosom,
And receive his inspiration, heat, light, and life.

Sing seven worlds, forming circles around the sun;
Seven ellipses of the earth falling to the sun;
Seven polar changes; seven creative days:
Six ages past, this the seventh; two days to come:
Two circles within, between the earth and sun:
In all, nine orbital circles around the sun:
Nine orbital ages: nine metamorphic changes:
Nine epochs of all planets approaching the sun:
Nine stages in the history of all planets,
From fire to form, from form to fire, from comet to sun.
The planet Neptune in the remote, far-off circle;
Nearer, in succession, Uranus, Saturn, Jupiter,
Asteroids, Mars, and seventh in place the earth,
Venus eighth, and Mercury ninth, near the sun:
All revolving, circling, falling into the sun.

Take thy flight backward in the eternities,
Into the chaos and cosmos of the dawning world;
Live again elemental war with fire and water,
Meteoric storms and the earth's forming shell,
When the heights poured out granite crystals,
Like fire-flies falling from the astonished sky;
And formed a boiling globe of wave-dashed rock;
Resting on central pillars of diffusing fire:
Then vapor wrapped the blazing world in soft embrace,
And kissed her seething bosom with lips of moisture:
Changing the molten red seas to snow-white granite;
And covered it with oceans of cooling water,
Created from falling tresses of its hair.

Sing six creative ages, metamorphic changes,
From chaos to form, in the history of the world;

The first of fire, the second of water, the third of life.
Sing spontaneous first-germs of life on the globe,
Oracles of progress through ages of long ago,
When mollusca and corals were building limestone
Out of the débris of their own dead skeletons.
Or when, on the fourth day, life had climbed to fishes,
And forests had absorbed black, carbon clouds,
Unveiling the earth's face, naked to the stars.
Then the world took a nearer path around the sun,
Causing an outbreak of abundant chaotic life;
And reptiles, springing from fishes, covered the earth,
And fowl filled "the open firmament of heaven."
And the unbalanced earth again took new poles,
Breaking its rock foundations, like a crumbling crust,
And assumed a new and nearer path around the sun;
Mingling the abundant chaos of life with glaciers,
Geysers, changing seasons, and new conditions;
Evolving on the fifth day numerous species,
Mastodons, monkeys: until, on the sixth day
Man makes the rising prophecy intelligible,
Hiding from savage beasts in caves and fens.

Sing how man arose, in painful, progressive steps,
From brute to bearing erect, and heavenward glance;
Slow learning the use of fire, emerging from caves;
Leaving scattered symbols of a history,
Reaching back five hundred thousand years:
Since which, North America has been buried in ice,
And Siberia a tropical, peopled clime;
For the earth rolled on other axial centers,
In another orbit, more remote around the sun.
Let symbols reveal a human lost age of stone,
And bronze implements in mounds and ruins
Tell the story of a long enduring copper age,
Once upon a time before the Noachian Deluge;
When our world reached an impossible ellipse,
Overturning on itself from pole to pole,

Establishing new motion, and path around the sun;
Beginning the present age of hieroglyphics,
Or letters, in the dawn of ancient Egypt,
Approximately, thirty thousand years ago.

Sing history, traditions, religions, wars,
Wisdom of antiquity, great men and minds.
Sing governments, society, family, home,
Mysteries enshrouding the human nature,
Post-natal influences, life hid within the womb: —
A history in miniature of all the ages:
Letting no subject pertaining to life's mystery
Escape its proper place in the harmonium song.
Sing how science confirms the Christian religion,
But leave untouched the sacred ground of its varied creeds.

Cast the horoscope of mighty ages yet to come: —
A millennium of righteousness, covering the world,
When the earth shall take new positions in the heavens.
Nearer the sun; plunging at last into his bosom.

Ring out the birth and history of the planets,
Their progressive creations and evolving life,
Rising higher in the scale, as they approach the sun;
Their present conditions and strange inhabitants.
First, and most remote from the sun, chaotic Neptune
With core of fire enclosed in cloud-belt vapors,
Late product of evolving, cometous, fiery car;
Next Uranus, with cooling shell and forming granite,
Veiled in gauze and draped with boiling waters;
Saturn next, with high, uplifted, volcanic rocks,
And life of oceans, corals, and shell fishes,
Dressed in thick vapors, and dark carbon clouds,
With superabundant rings and bright folding lace;
Then the planet Jupiter, with swimming fishes,
In endless shoals, filling her mighty oceans,
And coal-forming forests, covering the landscape,

Still draped in dark moisture and carbon vapors,
Fast fading gown of primitive, nebular days.
Nearer the earth, asteroids, with strange reptiles
Uncovered to the light of the sun, moon, and stars,
And winged fowl, flying in the ethereal air.
Mars next, closer on the earth, and resembling our world,
With picturesque scenery, and fierce animals,
Pterodactyles, mastodons, and monkeys,
Half-animal, half-human, fur-covered savages,
Struggling slowly upward, on the threshold of mind,
To a knowledge of right and wrong: divinest image.
Next in place the earth: age of man and reign of reason.
Then in order lovely Venus, closer on the sun,
Perhaps a world of ever-changing flowers;
Star of sweetest music, nurse of science and art,
Bliss of human harmony, one universal joy;
Disciples, in truth, of that meek and holy love,
Dawning on the earth, from the night of Calvary's hill.
Last, Mercury's more exceeding weight of glory,
Sarcophagus of purified, slow, circling ages,
On the border-land of final resurrection,
Soon to plunge into judgment, and the abyss of fire.
When "the elements shall melt with fervent heat."

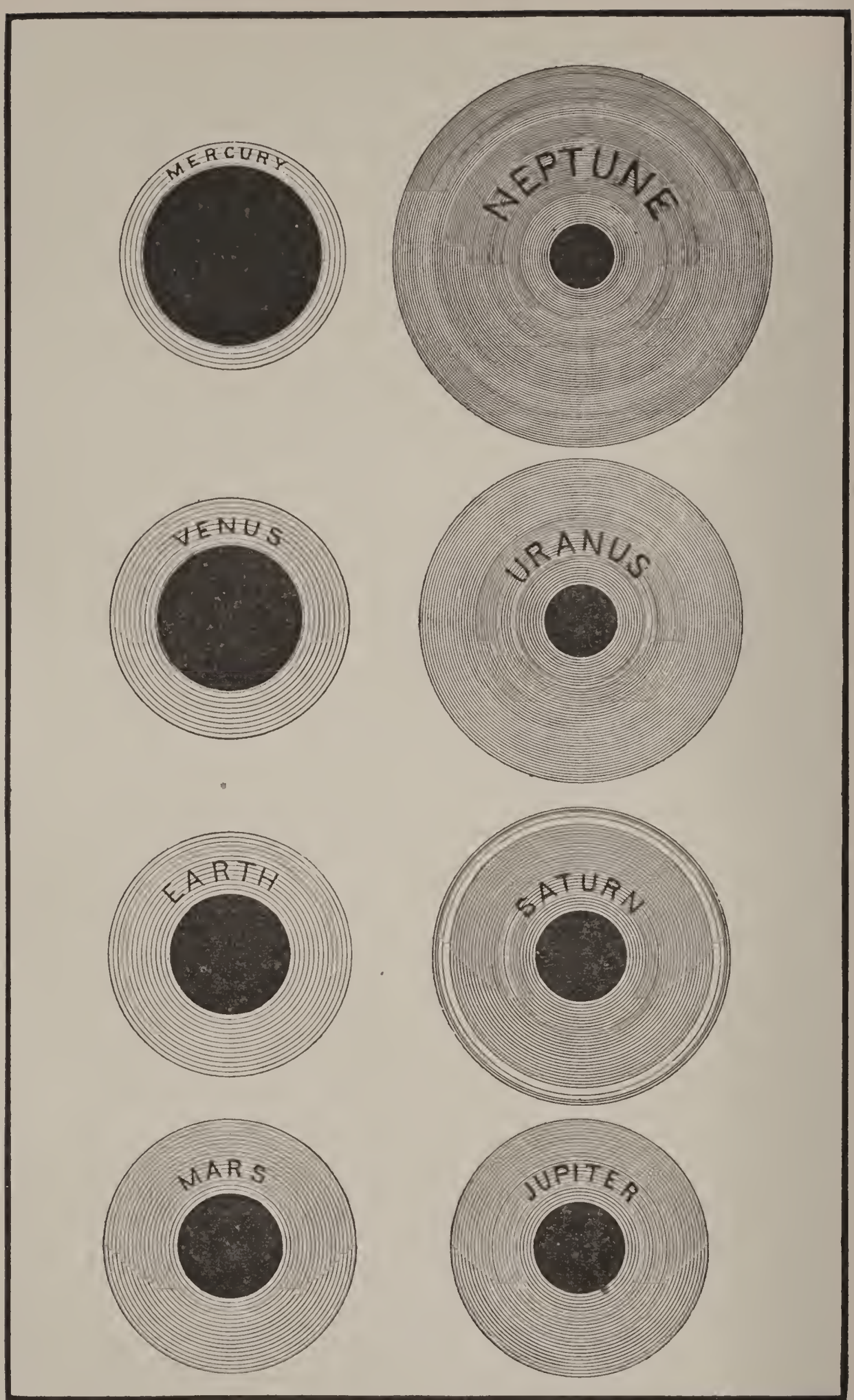
And thou, O sun! great source of light, life, and love;—
Father of worlds; majestic! almost eternal!
We crave to know thy beginning and thy ending;
For in all the glory and vastness of thy splendor,
There was a period ere thou hadst beginning,
And a like period will remain when thou art gone;
O sun, enchanting! divine thing of divine thought;
Splendor of life's dream! finite thing of finite thought;
Thou art but a porch lamp to that infinity,
Boundless in the mind, boundless in every atom;
Memories of thee will hang in highest heaven,
Thy blazing shield, when thou art gone forever,
And light landscapes with pictures of thy beauty,

When time, enchanted by thy tread, shall be no more.
O sun! diffuse with waving tresses of thy light,
Thine eternal elements into boundless space,
Take down thy torch fading from the sky,
And brood again infancy of time, and of days;
For immortality tied up in the soul of things
Has mirrored all thy pictures in eternity,
Has eclipsed thy glory, and thy world-creations,
With mirages more enduring and grander than thine,
And left thee, O sun! with thy many-colored rainbows,
Stranded in the eye, and fading physical senses;
While never-dying thought and soul of man immortal,
Lives on; if perchance a better kingdom is within;
Creating worlds where skies flash brighter suns,
Where shades never come and darkness cannot enter.
Roll on, O sun! tread stately your shining course,
Finish the cycles of slow circling ages;
And when brooding worlds, in cortege and car of thought,
Have all been gathered to thy paternal bosom,
And wrapped in the drapery of thy crimson couch;
Lying down on Infinity's Holy Mountain,
With book of time for thy subject meditations,
And eternity for thy pillow,—dream dreams,
And think visions; not of fleeting sinful life,
But of glorious new creations, infinite and eternal.

Make the song a chart and compass of eternity.
Sing universal order and destiny, alike
Of systems, suns, worlds, races, or of man.
Let meteors and the Aurora Borealis,
Satellites, and infinitely distant stars,
Ring out echoes in the completed, rounded song.
Words terse with meaning and nectar of living fire,
Jewels of thought, from every land and every age,
Newly chiseled, polished, arranged, and set,
In a small diadem and short modulated song.
Sing nature decked with smiles, wreathing the tomb,

Divinely set, with flowers in darkness and tears,
Birds in clouds, and angels above distresses.
Raise to lofty eminence integrity, charity,
Friendship, love, and every virtue its own reward.
Sing human birth and being, death and destiny
In gates ajar, of a bright immortality;
Or should, broken seals, the book display
Revelations of God, delight thee more;
Sing here thy new enchanting strain, thy grandest song.
Make the book a music so simple that all may drink
Its pure language, and read it like a talisman of love.

Thou didst fill Homer and Virgil's golden harps,
And grandly enchanting, prompt Milton's lofty strain.
Thou didst enlighten the mind of Galileo,
Unveiling above him thy parchment scroll of stars.
The earth confessed hidden fountains of thy truth,
When rocks, to man, told their story of every age:
Thine was the truth, and thine the eternal flaming fire
Of prophet, seer, or sage, in every land, by every tongue.
Thou didst inspire the eternal ten commandments,
In him who taught Israel's sons, or Egypt's seed,
How the heavens and earth rose out of chaos.
The temple of thy choice, before enameled gold,
Or towering spire, is the upright heart and pure:
Cleanse me from thought too low and base; teach rectitude,
Wisdom, and guide my erring pen, the eternal truth
In words to trace, like arrows winged with fire:
Showing forth in fixed and immutable destiny
Majestic attributes of equity and mercy:
And in the heights and depths of the argument
Vindicating devious ways of God to man.


MERCURY
NEPTUNE
VENUS
URANUS
EARTH
SATURN
MARS
JUPITER

WAY-MARKS OF TWO ETERNITIES.

CHAPTER I.

THE ROCK ON WHICH WE BUILD — MATTER, FORCE, CHANGE, AND CAUSATION — THE ETERNAL ATTRIBUTES.

Science has applied the term "matter" to all things which can affect the human senses, or act, or be acted on, by force; in short, to the elements which compose this universe.

It does not at present concern us whether matter is a gross material substance, existing outside and independent of all consciousness, or the actual manifestation of thought; as proclaimed in Berkeley's "ideal philosophy."

The things which we see, feel, and touch, which we can analyze, weigh, and measure; viewed from the standpoint of a dream, are nevertheless realities: and these realities science calls "matter."

Philosophy, following in the line of Spinoza, Hegel, Kant, and Fichte, may yet demonstrate that matter is, after all, an apparition of human senses; and all atoms the consciousness of certain forces, and of possibilities unknown to us, behind which may lie hidden infinities; and that this sublime universe is simply and grandly a thought manifestation, displaying through finite human senses, finite phases of its consciousness in human

thought; a thought creation, or consciousness, divine if you please, clothing and upholding every detail of this wondrous universe; and that the thought which surrounds and environs us, standing out in the objective, and clothed in reality, through our senses becomes our thought; ours finite, received from our surroundings, measured by our senses, and limited to our state and place.

Whatever be the true explanation of the fundamental principles or essences of this universe, we shall use the accepted term "matter" as the name of cause, force, and all things which science can analyze, weigh, measure, and contemplate. Therefore the causes, forces, and fundamental principles of this universe, are eternal. In other words,

MATTER IS ETERNAL.

Accepting our definition of matter, the above proposition becomes a self-evident truth, and to attempt its demonstration would be equivalent to the demonstration that God is eternal.

In short, this volume will use the terms "God" and "matter" as antipodes, and yet, in a philosophical sense, synonyms.

God, the name given by theology,— a name haloed in mystery, from which by a chain of causes evolves nature and known phenomena.

Matter, the name given by science as it examines the known, and traces a chain of causes back into mystery and mystery's God.

Philosophical synonyms; the positive and the negative, the known and the unknown; two names for the sum total of this universe, viewed from the two sides of the infinite sea.

The light of inspiration halos the one; it beholds nature in her cloth of silver and gold, her dazzling lights all arrayed, her harps all tuned, enwrapped, enchanted, wonder, reverence; this is God.

The other a critic, crucible, retort, weights and measurements, chemistry, analysis, philosophy, the why and wherefore; this is matter.

To the one, the author of this volume grants power, honor, and glory, and bends with all the adoration the human heart can hold. To the other, he becomes a submissive slave, driven by storm and tempest in a restless sea of thought. But we have said that matter is eternal.[1]

If this is not true, then logic has no foundation, and all human reason is a fallacy. We reason only by analogy and on the basis of analogy; I demand of him who believes this universe sprung from nothing, to create for me one iota of force, in the form of one atom of matter. Call up from nonentity, in a vacuum, and absolutely out

[1] This work is not a pantheistic system. Pantheism limits God to nature, and confines him within the physical universe, or to that portion of the universe which is proclaimed through human senses.

It is true that the physical universe is a phase of divine thought, the outward manifestation of God to his finite creatures, on whose existence it depends, *in whom we live, move, and have our being*. Pantheism, however, prescribes boundaries to the divine existence, and limits God to nature, or that part of nature which the human senses perceive.

Pantheism makes the Infinite a finite being, sustaining by his thought or consciousness that portion only of the universe which finite human beings can conceive. Pantheism says of the rocks and of the trees, of the oceans and of the stars, this, and this only is God.

Correct logic, however, proclaims from the very antipodes of limited finite senses, the existence of an Unlimited, an Omniscient, an Infinite — the universe, therefore, which we perceive is but a finite phase of God's thought, presented to finite beings through finite eyes, finite ears, and finite physical senses.

He is as high above the stars as the heavens are high above the earth. He is as infinitely above, beneath, and beyond nature as the blue ethereal

of nothing, one solitary atom of matter, and I will grant that you have proven by the analogy that other atoms sprung from nothing, that all atoms sprung from nothing, that the universe sprung from nothing, without cause or force.

Until then, the creation of something from nothing has no analogy. It is foreign to human reason, human observation, and at best but a dream of the imagination, contradicted by every source from which human reason makes deductions.

Logic will carry us further in the analytic syllogism; that which by its nature is unchangeable to-day, is unchangeable forever; and that which changes or is changeable to-day, is changeable and will change forever.

The whole panorama of this universe is a perpetual succession of changes — birth, death, and resurrection; but there is no annihilation; the fundamental constitution of matter remains eternal. Its form changes, it may become gaseous, liquid, or solid; it may unite in new combinations, and display properties which it did not previously manifest, but it is never destroyed.

In the great laboratory of nature, the process of change goes on forever; wear and tear, growth and decay,

vault is above and beyond us. He is as far beyond the perception of human sense or the conception of human thought as infinity is beyond finitude.

Above, around, and within this universe, there are other universes, other phases of God's thought, which we cannot perceive or conceive; we are finite, he is infinite. There are other universes, mansions of the infinite God unknown and unknowable to human sense or human thought; compared with the universe made evident through human senses to human thought, they are as the ratio of infinity to finitude, as the ratio of eternity to one moment of time; perhaps God has a universe as extensive and wondrous as ours within every atom.

Being above all beings, whom
We call God, and know no more.

dissolution by water and combustion by fire,— a thousand varied forces dissolving and reproducing in countless varied forms; but the fundamental elements are never destroyed; all these changes are only apparent in form and state.

The phenomenon of the universe is a perpetual succession of changes, but underlying it all are certain indestructible and eternal principles, allied to the attributes of the eternal God.

If we regard his attributes eternal, fixed, and unchangeable, they must act in fixed and unchanging laws, eternally manifesting themselves in equally eternal forces, the physical manifestations of which science calls "matter."

We have demonstrated the eternality of matter, as absolutely as logic can make a demonstration.

FORCE IS ETERNAL,

because force is the manifestation of the properties of matter, inseparable from it. We know nothing of matter, save by its forces. Each atom, so called, might therefore be regarded as a bundle of attributes, propensities, or impulses. Like human characters, acting variously in varied environments, atoms sometimes cling together by strong affinities, or leap apart with terrible force. Or, like the faculties of the human brain, atoms may remain dormant until the well-spring of their passion is touched by some peculiar influence, when suddenly tremendous forces are displayed.

Force shows itself in countless forms, but it can neither be created nor destroyed. All the inventions which have sprung from the brain of man, have never created one iota of force. They all simply direct and utilize the elements; force is tied up in them all, and

every chemical change, union, or disunion is the manifestation of force.

Carbon uniting with oxygen produces the phenomenon we call "fire;" at the touch of which water leaps into gas with a force sufficient to drive the locomotive on its track, or turn countless wheels of human industry. Nor is one iota of force ever lost, however much its form may change. The forces tied up in coal, when consumed for purposes of heat, are not lost; they have simply united with the elements of air, and become a food supply for growing vegetation, stippling nature with green, and building up mighty forests of oak and pine.

The majestic river flows onward to the ocean, absorbed by land and sun; yet gathering clouds convey it back again to the valleys, where, uniting with carbon, sunlight, and elements of earth in growing vegetation, it becomes a food supply for animal tissue. Thus fire and the moving river, the sunbeam and the cloud, are seen again in feathered songsters, moving beasts, and in the restless flood of human thought and human action.

On the principle that force is eternal, we find the splendid compensations which chain together the kingdoms of nature.

Behold above us in this blue ethereal arch that wraps the world in splendor, countless millions of great suns, all in motion, interchanging forces, each with each, heat, light, electricity; attracted and repelled; related to each other like separate drops of water in the ebb and flow of the mighty sea. See our world revolving on its axis and oscillating around the sun; impelled as by an omnipotent breath, wafting backward whole fleets of stars like ebbing waters.

See our sun revolving on his axis, giving light and life to a whole brood of worlds. See comets plunging through space with the rapidity of lightning, yet requiring hundreds of years to complete one revolution of their mighty orbits. See dancing meteors, and moving, mystic lights everywhere in this stellar sky. Look around on our world; see the heaving bosom of seas, the ebb and flow of tides, the perpetual round of rivers, changing seasons, whirling winds, wearing waters, and consuming fires; earthquake, volcanoes, storm and tempest, sunshine and shadow; behold on every hand the play of never-ending forces.

How startling the every-day revelation of chemistry, as it discovers new forces tied up in matter and combinations of matter.

Wonderful result, when by a union of two innocent substances, charcoal and saltpetre, gunpowder was invented; the tremendous powers of which, guided by intelligence, have changed the history of nations, and made for commerce and industry a new map.

Wonderful discovery, when glycerine was obtained from the fatty tissue of the human body. Wonderful discovery, when nitric acid was obtained from its fibrous tissue; more wonderful when, united, this new substance was found to be a terrific explosive, leaping into space to find new affinities.

Wonderful the hidden forces of the food we absorb to-day; wonderful the laboratory and transformation of that food when it becomes red blood; more wonderful the laboratory and transformation of that blood when it becomes passion, affection, thought, and action. Think of that laboratory in the language of Ingersoll, "Into

which was put food, and which came out the divine tragedy of Hamlet."

We are in a universe of eternal forces, manifested in the phenomenon science calls "matter," and in it all is proclaimed the principle that —

CHANGES ARE ETERNAL.

On every hand we are confronted with the phenomena of changes, unceasing as far as human experience can go; and these dynamic analogies demonstrate the eternality of change.

Change is the order of the present, it has been the order of the past, it will be the order of the future. We observe everywhere birth and death, growth and decay, elements forever mingling, and forever separating; the homogeneous evolving the heterogeneous, and the heterogeneous evolving the homogeneous; matter and force forever building up new combinations of beauty and of power, and as constantly dissolving. Sphinx-like from ashes arise new beauty and new life: the old is resurrected in the new; the past reappears in the present, clothed in new garbs of beauty and of glory.

Yon sun, majestic! treads his mighty path-way, crosses our world, and paints the landscape with life and light; night comes apace, robed in blankets of azure, and decked with the Milky Way of shining stars; days pile up years, and years file in single columns to their tomb; the sun has brought with him a perpetual change of seasons; receding southward, frost and hoary winter lock all nature in ice and snow; the silvery moon takes various positions and complicates the infinite changes, in the relations of earth and sky.

The whole aspect of our world is every day changing.

"THE HILLS, ROCK-RIBBED AND ANCIENT AS THE SUN." [45]

Oceans are encroaching upon continents, and continents emerging from the seas; waters are wearing away mountains, and mountains are being lifted by earthquakes and volcanoes to higher altitudes. Races appear and disappear. The tides of civilization ebb and flow. All things have a period of growth, reach a perihelion splendor, and then a night,— death and decay. And this is as true of worlds and systems of worlds, as of races or of man.

These majestic systems in the stellar heavens must live out their age, grow venerable with years, and crumble back again into chaos; but they will live again in a new garb of beauty and of glory.

Phenomena are everywhere transient: there are no forms irrevocably fixed.

"The hills, rock-ribbed and ancient as the sun,"

are constantly changing; rock and mineral-bearing quartz are matters of growth by crystallization; and the growth of mineral is as clearly demonstrated to-day as that of vegetation.

Unlike the old philosophers who considered matter dead and only acting when acted on by external forces, we infer from observation that motion or change is its constituent nature.

Nowhere in the mighty laboratory of creation is discovered inactivity, inertia, and death. Above us, around us, beneath us, are perpetual activities, unceasing mutations, eternal changes in matter.

ALL MATTER IS IN MOTION.

True, the ship is propelled by the wind, the engine by steam, and so on through the endless manifestations of force; hence the old philosophers concluded that mat-

ter possessed an inherent resistance to motion, which they called "inertia."

True, the rocky frame-work of the globe, on which we tread, has remained without perceptible change for ages; gravity, friction, affinity, and the opposition of surrounding forces has chained each atom to an apparently fixed position.

It is not, however, the inherent nature of the rock to remain motionless, nor of its particles; mighty forces are slumbering in its every atom, waiting only favorable opportunities, or the contact of other elements, to leap into terrific motion. Again: while it apparently slumbers, changes are taking place in its internal arrangement, and in the constitution of its atoms. Clay and sand are hardening into rock, and rock itself decomposing,—changes slow, stealthy, yet subtle and sufficient in the lapse of time to change its whole character. Again: it is not motionless, time after time it has rolled round with the world, and oscillated around the sun.

Therefore the power which wafts suns and worlds in their swift courses, must reside in themselves. This is the simple explanation of motion and change, perpetual and never-ceasing, observed everywhere in nature.

Motion is written on our sun, and all his system of moving worlds; in the silent forces which bear on its Atlas shoulders this globe of ours, that scintillates in the stars, rolling them in their vast revolutions, flashing forth light like fire-flies in the depths of immensity.

Motion belongs to matter; this is the simple explanation of all the mutations of nature; whether wafting great suns on their wings through space, thrilling atoms with life in chemical solution, or prompting the internal changes and varied movements of the living organism,—

ever the same whether accumulating atoms into the formation and motion of the raindrop, or binding with iron hand world to world or sun to sun in the great net-work of solar and stellar systems.

CAUSATION IS ETERNAL — FATALISM, NECESSITY — DESTINY IN THE MATERIAL, MENTAL, AND MORAL UNIVERSE.

From a given cause the effect necessarily follows and *vice versa;* if no determinate cause be given, no effect can follow.

That given causes produce given effects, is an axiom lying at the foundation of all human knowledge; and that the effect is the exact equivalent of the cause, and *vice versa;* the cause the precise measure of the effect, admits of no possible argument. And that every effect becomes in turn a cause, producing other effects, is also a self-evident truth, established by every fact of human experience.

Deny who dares these axioms, for by your denial your universe becomes a universe of chance; science goes out, wheels of industry stop, the mill turns backward and produces unexpected things, men feed on grass and their women conceive fabled monsters, while monkeys write heavy volumes of philosophy,

"The sun wanders darkly in the ethereal sky,"

old ocean becomes a slimy hell of snakes, mountains walk off on stilts, birds eat up the stars, the law of gravity repels, love and affection carry poisonous daggers of malice and hatred, and even anarchy and chaos groan and die:

"But this eternal blazon shall not be."

The eternal sequences of cause and effect are imperatively fixed in every phenomenon of this universe; causation is

king, law and order are his code; fatalism is in his right hand, necessity in his left, and destiny is written on his forehead.

Sequences follow of necessity; all phenomena are the outgrowth of causes, and causes foreordain and determine all effects.

The mind can only conceive first causes in the sense of an eternal change of causes, or in the sense of eternal principles; for when the mind conceives a thing as being the cause of itself, that thing is conceived to be eternal.

Matter may change from a solid to a liquid, from liquid to gas, and show itself in endless varied forms, nevertheless matter is the cause of matter, and eternal. Reason, logic, every faculty of the mind, proclaims the eternality of causation, and that the universe is an endless chain of cause and effect. We may not understand all the details of sequences, but it is certain that causation reigns supreme in every phenomenon of the universe.

Modern speculative philosophy, in the dazzling, silver-tipped pens of La Place, Comte, Heckle, Spencer, have been building a universe out of a boundless fog-bank of darkness, stillness, and death, sleeping unconscious in the gray abyss of a voiceless twilight, where, hitherto, no motion had been, no star had shone, and no life had lived.

If there had been a time far back in the eternal ages, when the sum-total of the universe was nebulæ, chaotic, voiceless, motionless, lifeless, silent, and still, there would have followed an eternity of silence and death, breathless, voiceless, motionless, and lifeless as the Sphinx; in which dismal night of monotone no moaning zephyrs or whispering requiems would have broken the sad expanse of silence and death, no phantom shadows could have

gurgled forth a silent echo, speaking the epitaphs of eternal night; silence, stillness, and death would have sat in his pale shroud, the enthroned king of all eternity.

But reasoning from a universe as it presents itself to our view,—a universe of force, motion, and causation,—all there is of logic and human reason proclaims that force, motion, and causation have been from everlasting to everlasting, the enthroned attributes of divinity, as eternal as his crown.

The mind can no more conceive the beginning or end of cause and effect, than it can conceive the beginning or end of God; they are co-eternal; causation is as fundamental a principle in this universe as that of time and space.

Were it possible for causation to cease, that moment Deity would fall from his eternal throne, God and his whole shining universe would crumble together into the vortex of oblivion; but in the immutability of cause and effect, we have the evidence of its permanence stamped with the seals of all that is eternal. All things chained fast in fate move on in their eternal wheels of sequence. Whatever is, has been, or will be, must be.

Absolute necessity is written on God's throne. It is stamped in his attributes, unswerving and inflexible; in every abstract principle which we ascribe to Divinity; in the eternal forces of justice, mercy, and love, which manifest themselves in eternal phenomena.

If you call the attributes of God the cause of the universe, then their eternal activities dispel the possibility of a beginning to their manifestation in the forces which underlie nature as its cause.

If it were possible for a human mind to understand all the causes and forces acting in the logic of coming

events, the world would have a prophet whose predictions would be true. Already this prophetic vision in astronomy, predicting conjunctions and eclipses hundreds of years beforehand, would have startled people of early times.

It is the province of medical science to examine diseases and predict beforehand the time for favorable changes, or count on its fingers the months or hours when death will occur.

Man is every day extending the boundary of his knowledge and widening his capacity to look backward into the past, or forward into the future, through the destiny of sequences.

A chain of cause and effect, fixed and imperative, reigns with despotic sway in every department of nature; it sinks the ship, though freighted with saints. The storm moves on, heedless of the foundering bark. It is the same to fire whether it burns living or dead matter; the same to gravity whether it brings the apple to the ground, or a human life falling to its death.

Nature can be governed only by obeying her laws. Man is happy only when he conforms to the forces of nature.

Jonathan Edwards, with the acumen of a master mind, seized upon the necessary fatalism of the forces of the universe, and constructed his theology of foreordination; and England's poet philosopher, Alexander Pope, declared, "Whatever is, is right." One fact is certain, whatever is, must be. And the same inexorable destiny which carries forward the panorama of the material world, reigns as imperative in the realm of human thought and human action.

"THE STORM MOVES ON, HEEDLESS OF THE FOUNDERING BARK."

FREE WILL, MORAL RESPONSIBILITY, AND ACCOUNTABILITY.

But man is free, and there sits enthroned in his brain a great "free will"— free to act out his nature according to his reason and his propensities; while his reason and his propensities, according to their environments, necessitate his every thought, word, and deed.

The child comes into life the embodiment of certain hereditary laws; deformed, diseased, perhaps blind; or if forces over which it had no control had been more kind, beautifully formed, with high prospective face and brain; the plan of life is fixed, the outline drawn, the stamp of destiny set.

The influence of parentage; a mother's love, subtle as the stars, fixing destinies in heaven or hell; early education, influences, environments,— all control, mold, and modify. Manhood finds character formed, seals of destiny fixed, and he is free. Free; if incurable destiny has made his heart and brain a hot-bed of devilishness to think thoughts and do deeds of villainy and crime. Perchance manhood finds a noble soul impelled by a nature, a brain, and heart divine to feel and act the part of justice, mercy, and love.

Like the magnetic needle trembling between various influences, man sometimes hesitates; he is changeable, fickle, unstable; but the stronger influences acting on his peculiar nature prevail, and he is free to do as he thinks, to act as he feels; and these are the forces which determine his life and conduct.

Men are always ready to give reasons for their acts, to point out motives which prompted given lines of conduct, and these reasons, these motives, are the magnets which fated their actions.

Yes! the attributes of God are free to obey their fixed and implacable qualities. Yes! the forces of nature are free to manifest their activities, fire, water, gravity, repulsion, light, electricity,—all are free to act according to their inflexible natures. Each element of the human mind is free—reverence, malice, selfishness, love, or hate,—all are free to act according to the measure of their existence in a given brain. And varied combinations of faculties and propensities in a given individual, produce according to environments given life and deed.

Show me a man whose towering head and intelligent, sympathetic face speak the possession of predominant high and noble qualities, and I will predict for you his future life and conduct.

Show me a man whose narrow, flat, receding, animal brain is a den where coil hissing, slimy serpents of lust and villainy, and I will predict for you the general outline of his future life.

But men are responsible for their acts, and accountable to God and nature for every thought and deed; and fate has fixed a law forever rewarding virtue and whatever is noble in human life, while pain and sorrow follow in the paths of vice and crime.

Happy he whose heart, mind, and soul, whose inward impulse and whose outward influences, impel to paths of nobility, goodness, and sympathy.

Unhappy he, on whose face, mind, and heart, God has written, "vile," in whose brain coils perjury, and forked snakes of villainy and crime.

How grand become the better social examples, with environments to save the tempted! How grand become the churches by the halo of their sacred influences, shield-

ing the weak, saving to nobility of life, to virtue and to God, the otherwise lost in vice and crime!

Hereditary law, a mother's love, early influences, education, and environments determine the heart and character of every man. The heart and character, with environments, determine life and conduct. And given causes are followed by given results in human thought and life, with the same inexorable certainty as in the realm of the material universe. Cause and effect reign supreme.

Think of it as we will, we are hedged in on every side by imperative necessity. The worm crawling at our feet, the world rolling in its orbit, or man grasping at the solution of mysteries, everything organic or inorganic, is driven on by destiny; and the march of sequences is as immutable as the attributes of the eternal God.

This work is based on the inflexible certainty of cause and effect; on the fatalistic chain of sequences, which have followed of necessity through past ages and past eternities, which must of necessity follow in coming ages and coming eternities.

We plunge into the awful vortex, struggling by the lamp of causation to fathom the past and penetrate the future, noting, perchance, the obscured or shadowy headlines in the history of the universe.

THE WAY-MARKS OF TWO ETERNITIES.

CHAPTER II.

THE PERPETUAL CREATION — DYING AND BEING BORN FOREVER.

The evolutions of nature appear sometimes progressive, sometimes retrogressive; but in the sum total of things they are neither progressive nor retrogressive. The progression of one phenomenon compels the retrogression of another.

Life is possible only amid death. We subsist on death. Strange as the paradox may sound, we could not live unless we died. The blood in our veins is a stream of red and white globules, each a world of organized life, as perfect as we; this is the food that supplies the brain, where death takes place, where millions of red and white globules die, and their life leaps out in thought, affection, and volition. Every thought born of man springs from death; the thoughts we are thinking, and the emotions we are feeling, leap out of this grave we call a brain. This map of humanity is the blood globules of an unseen life at the death of which leaps out judgment.

> "Whose restless iron tongue calls
> Daily for its millions at a meal."

Planets are the blood globules of the sun's life, at the death of which, plunging into his bosom, they will replenish his source of heat and life, and be wafted back

again to other planets, with other life, vivifying and renewing them forever.

The strata of the earth are as full of evidences of retrogression and extinction of races that have been, as are others of creation and progress. The apparent gain in nature of one phenomenon is counterbalanced in the loss of that from whence it derives its substance or power.

To suppose that the creation has been evolved by a law of progress is equivalent to the supposition that the Infinite Will has been evolved by a law of progress. Such a law of progress would carry all things, in short, God, back to a beginning, and limit him in time and space. Yes; admit such a law of creative progression, and the mind goes back to annihilation, and God and his universe fall together into absolute nonentity. What we call progression and retrogression are the simple sequences in an endless chain of cause and effect, producing new and constantly changing scenes. In the absolute, nothing is gained, nothing lost.

How grand the conception that when ages and cycles of ages have come and gone; when our world has grown old with years, and the tribes which inhabit her air, her seas, her hills, and her plains —

"Have laid them down in their last sleep,"

and our earth has become a voiceless tomb of death; when her venerable mountains, crowned with the weight of ages, and her hills and her rocks melt with fervent heat; when eternal activities have scattered her ashes to the four winds of heaven, and primitive ethereal nebula absorbed her substances back into the elements of her

birth; — strong still in death, her eternal forces will be tied up in her ashes; she will still live in the rich inheritance of all her past possibilities; and when millions of new panoramas have been enacted in the evolutions of her future, and cycles of ages have come and gone, it still will be possible for the unfolding of a system like our own, — peopled with an order of beings, then as now,

"With erect bearing and heavenward glance."

Matter may take new forms, assume new phenomena; but its forces and activities can never cease.

The long ages since our sun and our system first began to form from the chaos of suns and systems which went before it, is as a day, a second of time, compared with the ages and cycles of ages which roll back into eternity; in the which system after system of suns and universes have come and gone; developed from chaos into order and beauty, lived out their age, and crumbled back again into the eternal attributes; coming and going forever.

Standing on the philosophy of the eternality of matter, force, change, and causation; of the eternality of God, with his attributes clothed in substance, and animate with activity; what imagination can take in the past, go back into the eternities, contemplate other systems and other suns, sublime beyond description, evolving from chaos to a perihelion splendor, and crumbling back again into the eternal mind and bosom of the elements, dying and being born forever; appearing and disappearing like the foliage which clothes the landscape in successive summers, or the long train of generations in the parentage of living things!

"Eternity, thou pleasing, dreadful thought,
Through what variety of untried being,
Through what new scenes and changes must we pass!
The wide, unbounded prospect lies before me,
And this informs me, I shall never die.
The soul secure, in her existence, smiles
At the drawn dagger, and defies its point.
The stars shall fade away; the sun himself
Grow dim with age, and nature sink in years;
But thou shalt flourish, unhurt amid the war of elements,
The wreck of matter, or the crash of worlds."

CHAPTER III.

OUTLINE OF THE HISTORY OF THE BEGINNING OF THE CREATION OF THE HEAVENS AND THE EARTH.

"In the beginning God created
The heavens and the earth."

And now, reader, buckle on thy whole mental armor, and strive to get thee back, on the chimes of time, through eons of unnumbered ages, to a time prior to the earth's formation, to a time anterior to the sun's creation; and there in darkness and solitude, let the non-created mind contemplate the invisible universe.

For there was a time, far back in the eternities, when in the language of Job,—

"He spreadeth out the sky
Like a molten looking-glass,"

when all the matter which now composes our system was chaotic;

"Without form and void, and darkness
Was upon the face of the deep"—

a darkness pregnant with the possibilities of existing suns, and a chaos in which lay nascent the dormant forces of present life and progress.

Attraction, repulsion, affinities, and adhesion, with all the latent forces and active principles of matter, existed then as now, and elements, by chemical combustion, formed centers of motion; while surrounding cosmic

matter was impelled to motion around central craters of fire. Combustion is nature's method of all chemical change, union, or disunion of elements; and photospheres of light and heat marked the beginnings of future suns.

> "His garments were warm, and the light of
> His clouds did shine. His going forth was
> From the ends of the heavens. There was
> Nothing hid from the heat thereof."

Motion is the sequence of combustion; in short, combustion is motion and the destruction of inertia, and affinities and repulsions spring to the aid of combustion, establishing the order of motion, while momentum perpetuated rotary revolution.

We observe around us, in miniature, the analogies of similar motion; the whirlpools of the sea; revolving cyclones; wheeling water-spouts lifting their aqueous tresses to the clouds; the wheeling motion of liquids and gases escaping through openings; the revolving eddies of clouds in the stillness of a summer's day. He who has climbed the Rocky Mountains has seen, as I did, the sublime panorama, below, of the clouds, under the rays of the sun, building semi-globular monuments of revolving peaks.

Ages elapsed, and the great center of fire by its radiating heat and scintillating waves of motion, continued to call up from its lethargy the slumbering elements, producing strata of fire, with illuminated tresses extended outward like the elongated glare of comets, which in reality they were, falling towards the sun by gravity; and becoming expanded by the increased heat driven outward again in a series of sharp ellipses around the great attracting crater of fire; gradually assuming a

more circular path, in accord with the ether currents of the revolving vortex of fire, destined at last to fall into its crater.

Thus the first change in primitive matter, outward from a central sun, was the gathering into clouds of nebula; and nebula vitalized by the rays of the sun, became blazing comets; while comets slowly wrapped their shrouds of gas and vapor around the heart of their fires, forming stupendous, chaotic planets.

> "By watering he weareth the thick cloud,
> He scattereth his bright cloud,"

and planets lived out their age, and fell at last into the vortex of fire. This process went on during infinite ages, forming numerous lesser worlds, each in turn plunging into the molten sea, building up a tremendous crater of heat and motion.

Ages elapsed; gathering in by attraction and assimilating by combustion, and our sun took form, majesty, and beauty; and sent his light and heat far into space, imparting motion to the elements beyond.

In a former chapter we have proven the eternality of force and causation; and it does not much concern us whether rotary motion had been perpetuated through the ages of chaotic night, which separates the present from past systems; whether that long nebulous night was a night of storm and tempest, in which mighty evolutions and dissolutions were at play, reducing to their primitive elements the last vestiges of former worlds; and by the force of stupendous momentum, revolving currents forced the past into the present, and perpetuated the old order. It does not much concern us whether this was the origin

of motion in our system; or whether in that night of chaos, the activities of matter found an equilibrium in sleep; in which inertia took the place of momentum, and a chain of causation, motionless and still, perpetuated force in the semblance of dead matter, ready to leap into stupendous motion when touched at the well-spring of its latent power. The solution of these problems is unessential, and perhaps beyond the reach of human ken. We know, however, that force and causation are eternal; and this alone, in this place, is a sufficient explanation for the beginning of rotary motion in the creation. The sun revolved on his axis, and imparted motion to the elements beyond.

A maternal sun, first forming, gave life to comets; and comets lived out the period of their changes, evolving into planets; an infinite number of which have already gone over their whole evolutions; changing from bulky, gaseous to dense, leaden planets, and fallen into the sun.

That the planets were once stupendous cloud-banks of cometous matter, occupying a field equal to that of their present revolutions around the sun, is almost a matter of demonstration.

We shall show, when we come to deal with geology and chemistry, that the crust of our globe is the product of spent fires; that the water of all the seas once existed in the primitive gases of hydrogen and oxygen; the carbon beds of the coal-fields in carbon gas; and even the marble and granite were primitively an ethereal compound of gases.

The globe itself hung suspended in blankets of ethereal vapors, filling regions hundreds of thousands of miles in depth.

Far back in the eternities, our whole system was a sea of ethereal vapors, the center of which was the sun's present center, out of which has evolved the sun and all his planets.

Combustion is the universal law of all chemical change; whether it be the unfelt heat of the changes going on in the human organism; the flame produced by a union of oxygen and hydrogen gases, resulting in the production of water; or the residual ashes of a forest on fire.

That the substances of planets were gathered and condensed into single globes by the action of fire, is therefore certain; forming planets in the order of Mercury, Venus, outward to Uranus and Neptune.

In confirmation of this position, it may not be out of place to state that the general law of planets is that those nearest the sun are the smallest and most dense, and that they increase in size and are more rarefied with the ratio of their distances from the sun.

Again: the planets all rotate in one general direction, a natural result of the motion imparted by the sun's own primitive revolutions. The general ratio of distance is what we should expect, and it is important to know that astronomers predicted the existence of a planet in the gap between Mars and Jupiter, long before the asteroids were discovered; also Neptune, and calculated his distance from the sun before that body had been observed.

The correspondences we have shown, clearly demonstrate a unity of origin, pointing back to a homogeneous relationship, and a similar birth.

The history of the creation of our system is the history of the creation of all systems; they have all had

periods of inception and growth ; they will reach maturity and crumble back into decay ; they are finite, and being finite, the period of their existence is limited.

Our world, far back in the infinite ages, hovered in the chaos of nebula, where —

> "God in solitude sat brooding on the
> Vast abyss, and made it pregnant."

The world was conceived by the sun, lit up and impelled to motion — a comet ; she next became a chaotic planet, wrapping the heart of fire in deep vapors. She has occupied the position of all the outer planets, and becoming more dense, will take the place of Venus and Mercury, and finally fall into the sun ; perhaps to go out again in the form of light and heat into space ; evolving again zodiacal lights, the Aurora Borealis, nebula, comets, and other worlds of motion and of life.

> "Deep in yonder shining Orion where my life
> Began to beat ; forward, forward, let us range ;
> Let the great world spin on forever
> Down the ringing grooves of change."

CHAPTER IV.

WORLD-EMBRYOS — FOOD SUPPLY OF FORMING WORLDS — METEORS, COMETS, NEBULA, AURORA BOREALIS.

"See, a star is falling, said the people,
From the sky a star is falling."

Such is the language of the poet Longfellow in his "Hiawatha," and Milton, also, in the fourth book of "Paradise Lost" uses a similar metaphor: —

"Thither came Uriel, gliding through the e'en
On a sunbeam like a shooting star,"

and the most ancient as well as modern writers not only give accurate descriptions of the brilliant phenomena known as shooting stars, but employ them as metaphors. Homer, in the fourth book of the Iliad, describing the descent of Minerva from the heights of Olympus, says: —

"Like a star shot by the son of crafty Satan,"

and Ossian, book the first, makes the bereaved Furgus to exclaim,—

"And thou, Morna, loveliest of maidens,
Plunged in darkness, like a shooting star."

Plutarch, in his life of Lucullus, describes how a battle between Lucullus in command of the Roman army, and Mithridates, was prevented by the heavens suddenly opening, and there falling to the ground a large burning

body, in shape like a barrel, and in color like incandescent silver. The two armies were overawed by this unexpected occurrence, and each peaceably retired.

Anaxagoras, supposing these bodies fell from the sun, describes one larger than a chariot wheel. Pliny also describes a large one that fell in Gaul.

A meteoric stone measured by Pallas in Siberia was estimated to weigh sixteen hundred weight; and another in Brazil weighed fourteen hundred weight; while one on the bank of the Plata weighed fourteen tons.

In France there was a fall of meteoric stones in sixty different places, and Rambossom relates that in Leige over three thousand fell within a small compass.

Fire-balls sometimes fall in such numbers as to present the appearance of meteoric showers. Professor Newton quotes the following from an ancient Arabian record: —

> "Stars fell hither and thither, and flew
> Against each other like swarms of locusts."

Humboldt describes a shower on a magnificent scale witnessed by him in the Andes on the night of November 12, 1799.

The number of meteors that fall through the earth's atmosphere is often prodigious; and during the great storm of shooting stars of November 12 and 13, 1847, it was absolutely impossible to count or even estimate their number, thousands illuminating the sky at the same time.

A meteor of unusual size and brilliancy on the evening of December 12, 1876, was witnessed by thousands of people as it passed over the States of Kansas, Missouri, Indiana, and Ohio at a height variously estimated. It was seen first in the western part of Kansas travelling

eastward. In Missouri it began to explode, breaking into parts; it continued through Illinois, Indiana, and Ohio, till it consisted of a large flock of fire-balls, chasing each other across the sky, and was accompanied by terrific explosions.

The chemical analysis of many thousands of meteoric stones shows that they contain the common elements of the globe, and no substances foreign to it.

Although these bodies catch fire when they strike the earth's atmosphere, and are often consumed before reaching the earth, they do not originate in the air, but fall from regions of the heavens above and beyond; they are without doubt the condensed product of nebular matter, the metallic remnant of the combustion of a cloud of gas. For it cannot be supposed that these fire-balls, which reach the earth as solid bodies of rock and metal, weighing sometimes many tons, existed as such in their original state.

The primitive condition of meteors is vapor, like the primitive condition of hailstones. The vapors, however, in which meteors originate are far above the atmosphere of the earth; therefore every shooting star or meteoric stone represents a globe or cloud of gas, falling with terrible force upon our atmosphere, and through it, in a blaze of fire. The metallic ball which falls upon the earth is the unconsumed portion of original vapor. Nebular bodies sometimes strike the atmosphere with terrific explosions, throwing fire-balls in a thousand diverging lines, like the radiation of a fan; this phenomenon has been repeatedly witnessed, and the roar and concussion of the explosions heard and felt. We must therefore regard meteoric stones as the residual dross of a burning ball of nebula, like the ashes of all fire, falling red-hot,

THE AURORA BOREALIS, AS WITNESSED BY DR. HALL IN THE ARCTIC REGIONS.

and sometimes in a liquid ball of metallic substance upon the earth ; and meteors have been known to fall upon the earth in showers of dust.

Extensive cloud-belts of cosmic matter fall with terrible velocity upon the earth's atmosphere, moving sometimes in another direction more rapidly than the earth itself. The Aurora Borealis is the magnetic manifestation of extensive tracts of such mists, and it is not strange, when we consider the awful rapidity of the earth's motion, that it appears to us like a rapid electric display.

We are rotating with the earth at the terrible speed of two thousand miles an hour, and moving in almost lightning speed around the sun ; therefore the gossamer blankets of nebular substance suspended in the planetary spaces, or moving in like rapidity in other directions, give rise to the display of fluctuating rivers of gold, streaming prisms, lightning flashes, and swift-changing colors of the northern lights. Striking the earth's atmosphere, the Aurora Borealis often explodes, throwing down fire-balls and meteors in wild profusion. And it has been shown that the epochs of the Aurora Borealis wonderfully correspond with the periods of meteoric showers.

Captain Hall, the arctic explorer, thus describes an Aurora Borealis witnessed by him in the polar regions : "The rising arch every moment gave varied and magnificent changes ; gradually it reached the zenith, when suddenly rivers of molten gold shot across the heavens, rapidly changing to whirlpools and mighty cataracts, then flashed forth suddenly a thousand rainbows, while a number of fire-balls fell during the display, and burst, throwing out prismatic scintillations."

It is almost a matter of demonstration that extensive bodies of nebular matter in chaotic and disorganized masses, are moving through the planetary spaces between suns and systems; the closer mists visible in the form of the Aurora Borealis, and the more condensed and extensive filling vast regions of space in the form of comets.

The closer nebulous substance striking the earth's atmosphere in detached fragments produces the phenomenon of shooting stars, while the dross of their explosions falls to the earth in meteoric stones.

Meteoric showers are therefore caused by the earth plunging through extensive regions of chaotic nebula without beginning or end, wheeling in sharp ellipses around the sun, intersecting at various points the path of the earth. The earth plunging through these rivers, is struck by numerous cosmic globes, while the earth's attractive force drags many others after it, causing them to revolve around the earth for some time like imperceptible moons, until they fall upon its atmosphere in the form of shooting stars.

The earth encounters one of these currents each November, and a shower of shooting stars which, in periods of every thirty-four years, becomes magnificently extensive. These facts prove the existence of a circle or river of meteors around the sun, the denser flood of which intersects the earth at intervals of thirty-four years.

The asteroid belt of small planets is an illustration of a river of meteors. The asteroid planets are computed by the thousand, meteors by the hundreds of millions; they have their orbits and regions of travel like the large planets, and the sun holds them and the giant Jupiter by the same power.

Rambossom says, "The period of revolution, eccentricity of orbit, and position of perihelians of these

meteoric storms, conform to the motion and course of comets," and showers of meteors follow after Biela's comet, as proven by the number of fire-balls the earth encounters crossing the path of this comet. Observation confirms numerous such instances, as if comets left a scattered débris of themselves behind.

Comets must therefore be regarded as more condensed oceans of unorganized nebula, containing the elements of all planets in a chaotic condition. The sun shines upon and through comets reflecting various lights, while their own centers are undoubtedly seas of fire, wrapped in an ocean of nebula millions of miles in depth. In the fiery centers of comets rapid changes and terrible combustions are taking place, and chaos is struggling towards organization. With a central whirlpool of fire, the surrounding folds will in time wrap themselves around a central fiery core, pouring ashes into a central pot, to form the rock foundations of future planets.

The tail of a comet seems to be perpetually in motion, continually fluctuating, and Lockyer saw in Coggie's comet evidence of revolving motion. Olbers saw in a comet a sudden flash of light which vibrated through it, the tail appearing to lengthen and shorten.

Father Secchi says, "The conviction can scarcely be resisted that the nuclei of comets not only emit their own light, but reflect the light of the sun. "The tails of comets," says Newton, "are not permanent appendages, but rise in separate detached envelopes, like the ascending smoke of a steam-ship."

The position of the illumination which we recognize as the tail, is always away from the sun; hence it has been inferred that the sun exerts a repulsive force upon it. It is not, however, the repulsion of the sun, but the mingled rays of his light, in unison with the comet's

central fire, that illuminates with electric and phosphorescent splendor only the side most remote from the sun, and beyond the comet's nucleus.

We conclude that comets are stupendous moving nebula, with revolving fiery condensation in the center, and radiating equally in all directions; and that its light, with the light of the sun, makes visible to us only a line outward from the center and opposite the sun.

Like the varied phases of the moon, the main body of the comet is hid from our observation, which probably fills nearly a sphere.

On this hypothesis, we find a ready explanation of the changing and ever-varied aspect of comets. The central fiery nucleus is the crater of terrific convulsions and explosions, into which vortex surrounding matter is constantly plunging; and anon converted into phosphorescent vapor.

A few comets seem to have a partial crust, obstructing the radiation of their fires, and giving rise to a number of so-called tails; or comets with two or more tails, may have two or more nuclei, as witnessed in double comets. The comet of 1870 divided into halves, and travelled apart a million and a half miles in five years.

Another strong evidence that the nuclei of comets are the centers of radiating circles of matter, is presented in the fact that all comets, when approaching the sun, first become visible, shortly after the nucleus, in the form of a semicircle on the side toward the sun, giving rise to the erroneous belief that tails of comets are presented to the sun; in a short time, however, as the comet grows brighter and larger, a tail develops on the opposite side; while the first lines of illumination disappear.

BOLIDES OBSERVED OVER THE RUINS OF KARNAK. [77]

A number of instances support the theory that comets may have become planets; a remarkable case of this sort is afforded in the comet of 1770, visible to the naked eye for four months. Astronomers were surprised to find the period of its ellipse to be only five years; it ought therefore to have appeared in 1776, and should have returned to its perihelion in all twenty times; but has never been seen since. Its history is this: approaching the sun from the stellar spaces, it passed near Jupiter in 1769, by whose attraction its orbit was changed to an ellipse of five years; it made two revolutions around the sun, and has since disappeared from observation. While receding in broad day, Jupiter again affected the ellipse to such an extent that, lost to view, it may have set up an independent axial motion with a new and more circular orbit, exterior to Uranus, and discovered by Galla at Berlin on the 23rd of September, 1846, named and since known as the planet Neptune. We make this supposition only in illustration of a theory.

The existence of Neptune was previously predicted in the same year by M. La Varies, by indications drawn from disturbances in Uranus. The discovery of this planet as foretold encourages philosophy, in the language of Pliny, "To seek those eternal truths concealed behind the majesty of theories."

The comet of 1840, observed, in all, six times, was made out to have an ellipse of seven years. In 1846 it separated into two complete comets, which made their last visits in 1852.

Although carefully looked for, these comets have not returned; instead of the comet, however, we had a shower of meteors. The old orbit of the comet crossed the point of the earth's intersection in September, 1872, while the

earth crossed the same point on November 27. From these causes, a predicted shower of meteors was fulfilled to the letter.

These two comets have disappeared perhaps forever, and it is not impossible that they may have attained the age of axial motion, and settled down as formal planets, among many thousand lesser bodies which have been counted in the asteroid belt.

Encke's comet is at the present time passing its transitory stage from a comet to a planet, not only in form and external appearance, but in its motion, rapidly changing from an ellipse to a circle, and therefore from the natural orbit of a comet to a planet. The period of its revolutions around the sun was at one time four years, which period has been perceptibly diminishing with each revolution. The comet is a globular mass, shaped like an egg, with internal condensations increasing centrally to an opaque nucleus, similar to the shell of the earth. The aphelion of this comet is already less than a number of planets, and the length of its year less than the planet Mars. This comet is year by year and century by century assuming the form and stability, path and motion, of a true planet.

Poison, in a paper read at the Academy De Science, at Paris, says: "This body ought to be regarded as a planet, but it is still classed with the comets, because of its diverse appearances, and the fact of its not being visible to us at all periods of its orbit."

The planet Saturn still possesses many of the external characteristics of a comet, surrounded as is the central core by a great cometous envelope, or fog banks of gas thousands of miles in depth; extending even into stupen-

GREAT SPIRAL NEBULA AND ENCKE'S COMET. THE EARTH AS IT WAS IN ITS EARLY EMBRYOTIC STAGES.

dous surrounding rings of cometous matter, held outward from the body of the planet by the terrible rapidity of the revolving mass. Like the external drapery of comets, stars can be seen through all parts of Saturn's rings, and through the borders of the planet itself.

Our own world was once a body nearly if not quite as bulky as Saturn. And it is the history of all planets, including the history of the earth, as their fires go out and the surrounding nebula of gas and vapor crystallizes into a central solid core; the carbonic acid gas into coal; oxygen and hydrogen into water and a stratum of pure air; and other condensations perfect it, building up the surface strata of soil, thus making their external circumferences smaller, will lessen accordingly the rapidity of their axial revolutions, and by their increasing density compel them to assume positions nearer and nearer the sun; while new planets from in-coming comets will take their places.

The motion of comets is due to their expansive nature under the rays of the sun, and to the rotary currents imparted by the rotary motion of suns. Approaching the sun, they are expanded by his heat, and become lighter in reference to the ether in which they float, and therefore are driven outward, where cooled and condensed, they again plunge rapidly, in motion modified by the sun's rotary currents towards him; hence the motion of comets is always that of an ellipsis around the sun. The movements and motion of comets might be compared to a gigantic pendulum; driven outward by the sun's expanding power and called back again by their cooling contractions; carried around the sun by his surrounding rotary currents. In chapter nine is an explana-

tion of the reason of the motions of all heavenly bodies, due to the expanding and contracting influences of the sun.

When a comet has formed a central solid nucleus sufficiently fixed and stable and of sufficient dimensions to obstruct the sun's rays, then continuous expansion of the surrounding atmosphere can occur only on the side towards the sun, and continuous contraction on the side opposite the sun; this would cause a rotary motion of atmosphere around the solid nucleus, and with it a rotary motion of the nucleus itself. Axial motion would be established, and the comet would be a planet.

This is precisely the history of the transition of comets to planets. Each and every planet was once a comet, but with the formation of a central solid nucleus it became a planet, began to revolve on a central axis with day and night thus established, and to continue in an orbit like Encke's comet, less elliptic, and more circular around the sun. Such is the destiny of comets, and such the history of every planet.

Comets numerous as the fishes of the sea are the budding flowers, the embryos, of the infinite creation of future worlds; in the end to mantle with life and love, and on their bosoms to animate the immortal possibilities of creatures in God's image, capable of studying the mighty plan and adoring the Creator.

If comets are actual bodies of cosmic matter, with central seas of furious flame, feeding their fires on nebula, and evolving central condensations, we ought to find still more attenuated substances in the heavens.

The zodiacal light and the Aurora Borealis are almost ethereal folds of matter in the planetary spaces, encircling the sun, and wrapping him and his planets in

downy robes and soft ethereal blankets and gauze of vapors.

In this we behold the residual substances from which our system was formed, and like which far back in the eternities, the sun and all his planets filled the heavens with substance invisible. The zodiacal light and the Aurora Borealis are composed of extremely rarefied substances, upon which comets still feed, replenishing the source of their fires, and drinking its substance into their own phosphorescent tresses; thus preparing the elements to form rock and water, with atmospheric mantles, rounded into worlds, and to settle down as staid and formal daughters of the sun, moving with slow dignity around him, the choice of their affinities and attractions, by whose vivifying warmth they will move in a chain of ceaseless evolutions, evolving various types of life, to climb up and culminate in —

> A mysterious mankind, like a fire-breathing
> Host, plunging across the astonished world
> To the portals of a life beyond the tomb.

Nebulæ, presenting themselves in great numbers, have been perplexing problems to astronomers, some of which are visible to the naked eye.

The great nebula near the multiple star Theta, is enveloped with a greenish white light; under the telescope it appears strangely like the head of a fish.

A nebula described by Sir John Herschel, in the constellation Lyra, presents an appearance strikingly similar to Saturn's rings; surrounding a central nucleus, together appearing as if a gauze with luminous points had been stretched across the ring, and its borders fringed with light.

Near the star Gamma is seen an elliptic nebula, intersected with highly illuminated points, the brightest of which are in the poles of the ellipse. The nebula in Cannes Vanetaci presents the appearance of two globular clusters, surrounded by a ring at a considerable distance. The nebula in Ursa Major is circular, and shines with a bluish light. Nebulæ have been variously classed and are observed in immense numbers.

We can form some idea of the tremendously remote distance of these mighty oceans of unorganized matter, by watching the increasing smallness of comets, as they move away from our system in a direction towards them. The largest comet, even when viewed with the telescope, soon becomes a minute dot; the comet is still comparatively near us, and the nebular oceans, even visible to the naked eye infinitely beyond. How immense, therefore, must be the remaining fields of chaos. It was formerly supposed that these distant nebular oceans were other Milky Ways, other universes of suns and systems in the immeasurable distance. Spectroscopic analysis, however, with its wonderful revelations of the elements of which remote bodies are formed, proves to the contrary, and astronomers are to-day unanimous in the conviction that nebulæ are extensive fields of unorganized and chaotic matter.

This system of suns of which ours is a part, comprising the Milky Way, is but the early dawn of creation. Organization and growth are day by day pushing themselves into the remote boundaries of immensity. When we try to conceive the possibilities of a boundless eternity, what imagination can fathom the past, or take in the future of God's creation?

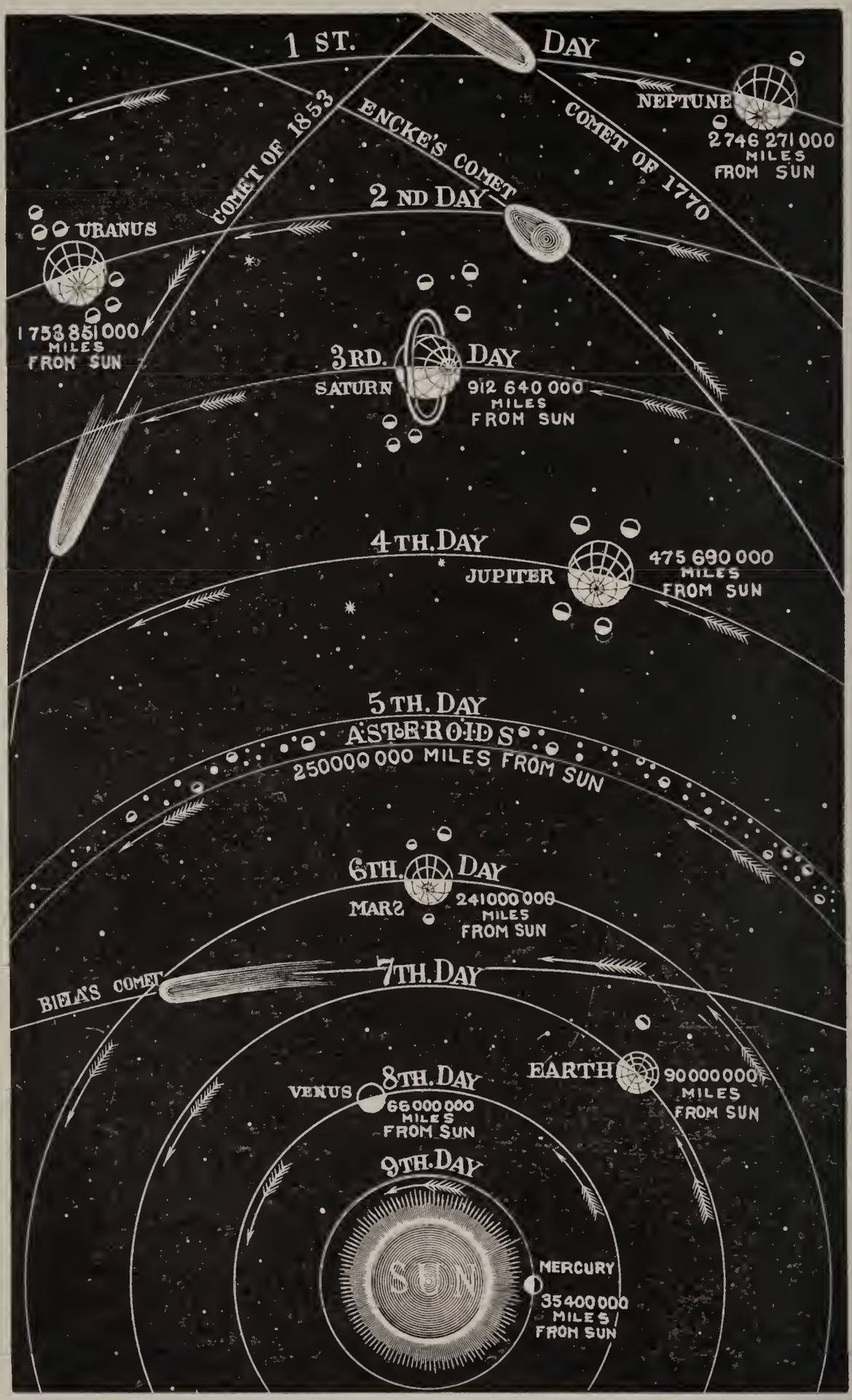
Nebulæ are most abundant out of, and remote from, the starry sky, in directions looking out into immensity two ways from the flat wheel of the Milky Way. The constellation Virgo is so rich in them that a portion of it has been called the nebulous region of Virgo. Not only is the Milky Way the freest from nebula, but the portions of the heavens farthest from it are the richest.

Magnificent condensations and changes are taking place in various nebulæ. Andromeda and Arago are sensibly changing their forms, also the very interior of the great nebula in Orion. Herschel, by watching the light passing through it, concluded that motion was taking place in its depths; the condensation of millions of miles would scarcely be apparent to us, in the immense distance; with the most powerful telescope it would appear as the thinnest line.

When we look out into the heavens and contemplate these oceans of nebula; comets in various transitional stages; planets also in every stage of development, from the chaotic fog-banks of Neptune, to the hills, oceans, and snow-capped poles of Venus: beholding thus matter in every possible stage of organization and development; from the unorganized nebular seas, filling regions of space equal to our Milky Way; the self-luminous vapor wrapping our system with the zodiacal light, and trailing the Aurora Borealis in giant folds through the planetary spaces; comets crossing the sky with their million miles of trailing gossamer, and still others with opaque bodies through which no star can be seen save in the outer edges, precisely as we see the stars through the external portions of the planet Saturn; with planets becoming more dense and earth-like with each step as they ap-

proach the earth, and still more dense like Mercury as they approach the sun; beholding thus every possible stage of universe and world-development, the past and future of their histories become like the past and future of the histories of the separate trees in a forest.

In a forest we observe; here, sprouts just opening; intervening saplings; trees in every stage of development, to hardy giants that have withstood the storm and blast of centuries; are we not forced to the conclusion that the majestic tree was once an opening germinal bud? So with this forest of stars; at a glance, from the divine thought of man he beholds the stages of development.


1 ST. DAY
NEPTUNE
2746 271 000 MILES FROM SUN
COMET OF 1853
ENCKE'S COMET
COMET OF 1770
2 ND DAY
URANUS
1 753 851 000 MILES FROM SUN
3RD. DAY
SATURN
912 640 000 MILES FROM SUN
4TH. DAY
JUPITER
475 690 000 MILES FROM SUN
5TH. DAY
ASTEROIDS
250000 000 MILES FROM SUN
6TH. DAY
MARS
241000 000 MILES FROM SUN
BIELA'S COMET
7TH. DAY
EARTH
90 000 000 MILES FROM SUN
VENUS
8TH. DAY
66 000 000 MILES FROM SUN
9TH. DAY
SUN
MERCURY
35 400 000 MILES FROM SUN

CHAPTER V.

EVOLUTIONS OF THE PLANETS — THEIR PAST, PRESENT, AND FUTURE — THE INHABITANTS OF EACH.

"The heavens are the work of thy fingers ;
All of them shall wax old like a garment,
As a vesture shalt thou change them ;
But thou shalt endure."

Let us assume, for the purpose of conveying a clear idea of a principle, that the nine planets of our system, having been evolved from comets, all began, commencing with Mercury, as bulky nebular bodies, on the extreme outer confines of our system, near the present orbit of Neptune ; and that through the epochs of untold ages, they have been, step by step, assuming positions nearer and nearer the sun ; and with each successive involution, the old orbit has been re-occupied with the early chaotic nebula of all the planets, in succession, commencing with Mercury and ending with Neptune.

And in conformity with the record of Genesis, let the orbit of Neptune represent the first day in the histories of all the planets, Uranus the second day, Saturn the third day, Jupiter the fourth day, Asteroids the fifth day, Mars the sixth day, Earth the seventh day, Venus the eighth day, and Mercury the ninth day.

From the basis of this reasoning, it will appear that Mercury is the oldest planet of our system, having occu-

pied, during the evolutions of her mighty history, the positions of all the planets; and perhaps witnessed the departure of still older sister planets, plunging into the sun; and now she, herself, gray with age, and venerable with progress, occupies a position, like Moses, viewing from Nebo's mountain her future eternal weight of glory in the radiating brightness and scintillating splendor of the sun, into which she must inevitably fall, to be followed in succeeding ages with each and all of her younger sisters; while comets one by one, assuming the garb of planets, take their places. Therefore a time will come when the earth, winding her way through eons of ages, shall have become —

"Ripe for the harvest and red for the wine-press:
And he that sat on the cloud thrust in his sickle
Upon the earth, and the earth was reaped.
I saw a mountain, as it were, thrown into the sea,
And a third part of the sun was smitten;
There was time no longer. Hear, O heaven!
And hear, O earth! I have nourished and
Brought up children, I will shake the heavens,
And the earth shall remove out of her place;
The earth shall reel to and fro like a drunkard,
It shall be removed like a cottage;
The earth shall be broken down,
It shall be clean dissolved."

Let us here lay down a positive and unerring rule, the principles of which we shall fully explain in chapter nine; the distance of all planets from their sun is proportionate to the amount of their atmosphere, relative to the weight of the solid nucleus.

The planets nearest the sun have relatively but little atmosphere, while the remote planets are composed mainly of nebulous or atmospheric matter.

Therefore, if the planets have all evolved from comets — stupendous moving oceans of chemical elements, with a central nucleus of fire — thence to planets — at first great revolving chaotic bodies, with an incrusted core of fire — from which condition they are slowly crystallizing the surrounding mineral gases into rock and metal, their carbonic acid gases into coal, their vapors into oceans; and otherwise converting their atmospheres into solid earth; — then it follows that they must with such changes assume positions nearer and nearer the sun, and finally without atmospheres plunge into his bosom.

We shall yet demonstrate beyond the cavil of argument that the earth once occupied a position far more remote from the sun than at present, when she was in a chaotic state, a great, bulky cloud-bank of nebular matter, nearly if not quite as large as Jupiter; and that by successive condensations and contractions, her axial and orbital motions have changed accordingly; and that she has by successive steps, covering infinite periods of time, taken positions nearer and nearer the sun, and this is true of all the planets; they have all evolved from cometous nebula, coming in from the outer confines of our system, evolving step by step rock incrustations and solid shells, becoming smaller and more dense age by age, and taking positions nearer and nearer the sun. Venus, therefore, is the earth's next older sister.

"Smiling downward on this earthlier
Earth of ours,
Closer on the sun, perhaps a world of
Ever changing flowers,
Every tiger-madness muzzled,
Every serpent-passion killed,
Every grim ravine a garden,
Every blazing desert tilled."

Beyond Venus, and nearest of all the planets to the sun, comes Mercury. Mercury may be seen just after sunset, and immediately before sunrise, according to the position she happens to occupy in her revolutions around the sun, in whose superior brightness she is lost in the day-time. She is two thousand nine hundred and fifty miles in diameter, and distant from the sun about forty times the sun's diameter — thirty-seven million miles. The period of her day is slightly longer than the earth's, rotating on her axis once every twenty-four hours and five and one-half minutes. Her year corresponds to three of our lunar months; completing her revolution around the sun once in every eighty-eight days. She is enveloped in an atmosphere, probably less and more ethereal than that of the earth's. There are mountains on her surface eleven miles high, and the flattening of her poles, by centrifugal force, is plainly visible through the telescope.

Venus, next, is a body about the size of the earth, sixty-six million miles from the sun. Her day is twenty-three hours, twenty-one minutes, and nineteen seconds, and the period of her year is two hundred and twenty-five days. Venus is the most beautiful and brilliant of all the planets, and can often be seen during the day-time with the naked eye. Because of her superior brightness, she is known as the morning star, and when her revolutions carry her above the sun, as the evening star also. Oceans and continents with mountains twenty miles high, are plainly visible. The spectroscope has analyzed her atmosphere, which does not greatly differ from that which supports vegetable and animal life on our globe.

It will not be out of place here to refer, shortly, to the character of the people which inhabit Venus and

Mercury. But first let us answer the more general questions, if planets are inhabited. We answer, yes, an affirmation which admits of no misgivings, and an affirmation which every one who studies this volume must accept. For if we succeed in proving that life is a natural product of our own planet; that forces tied up in her elements become living forms, according to environments; in the air, water, or on land, amid arctic snows, or under the burning sun of the tropics, in dark caverns within the earth; yea, within our own organizations, the exact antitype of the conditions which produce them; if the earth is the mother of our life, if her blood flows in our veins, if we have inherited her forces and received from her our knowledge, by her diversified picture-paintings and multitudinous lessons surrounding us on every hand; — then it becomes self-evident that the planetary gardens in the heavens with soil, water, air, sunlight, and elements variously mingled, are of necessity theaters of life and animation.

Again: if geology proves that life has progressed with the progress of the earth herself, climbing higher and higher with each new advantage, always responding to new and higher environments, in all the little or stupendous changes that the earth has seen, changing accordingly the whole plan and map of her living creatures; and if Venus has travelled the whole progressive history of the earth and gone an added epoch beyond, we must infer that sentient, thinking, feeling beings have risen in mind and heart, in intellect and in morals, to a condition transcending all human conception.

Venus is studded with continents, decked with lofty mountains and broad valleys, where flow majestic rivers onward to her oceans. Hills and dales, slopes and

meadows, covered with majestic trees, and bright verdure, spangled with ever-changing flowers, impart their million colored shadings to all the landscape.

Imagine the Swiss valleys with their torrents, their lakes, their meadows, their gardens, their groves and lawns, in the midst of a southern sea; add to these the Loire hills, crowned with vines and fruit-trees, the tropical produce of the Moluccas and the bright-plumed birds of Java. Imagine the shores overshadowed with cocoa-trees, studded with oyster-beds, madrepores and corals growing, amidst perpetual summer, to the height of large trees in the bosom of the ocean, rising above the water at the ebbing of the tide, which lasts for twenty-five days, and harmonizing their scarlet and purple hues with the verdure of the palm-trees. And imagine, finally, currents of transparent water which reflect the beautiful spectacles, ebbing and flowing from isle to isle with a flood of twelve days and a reflux of twelve nights, and even with all this you will have but a very faint idea of the landscape in Venus. As the sun at the solstice rises more than seventy-one degrees above its equator, the pole which illuminates it possesses a temperature much milder than our spring. Though the nights have no moons to light them, Mercury, by close vicinity, and the earth, by reason of its size, are to Venus more than equal to our moon.

The inhabitants, about the size of ourselves, since they dwell on a planet of the same diameter, but in a more celestial zone, must devote their time to love, to the highest intellectual pursuits, to music and the arts, to religion, and the worship of their Creator.

For an ideal description of the high civilization, architecture and agriculture, system of government,

science, art, and the religion of the inhabitants of the planet Venus, read chapter thirty-seven of this book, a chapter predicting the future of humanity on the earth.

And if Mercury represents still another and added epoch of history, looking back, perhaps, to her human age as we look back to our age of reptiles, then it follows that this bright star near the sun is two days, two epochs, two grand evolutions, beyond the earth; two days, two cycles in the ages, nearer the goal of glory.

Ours is an age of shadow, an epoch of transition, dim prophecies of what shall be. Venus is in the full tide of intellectual and moral human development; hers is an age of perfected humanity, prophesying ethereal spirit; and Mercury perhaps represents an age of celestial spirit-purity,—prophesying God.

The earth is the next planet in the order of distance, ninety-five million miles from the sun. She is eight thousand miles in diameter, and is attended by one moon, a small body one fiftieth the size of the earth, two thousand miles in diameter, the sun-lit hemisphere of which does not exceed the size of South America. The moon is a barren volcanic waste, without oceans, rivers, or atmosphere,—

> A barren desert, lifeless plain,
> Where silence and sadness reign;
> No heaving oceans, or breathing air
> Mantles thy bosom once so fair
> With life and love; thy course is done,
> Thy story of animate ages run.
> Dead thou art, thy children dead,
> Entombed in one sad, rocky bed.

Airless, waterless, motionless, lifeless; the moon is carried by the ether currents imparted from the earth like a

float in the wake of a ship; as it were on the shoulder of the earth around the sun.

The moon moves incessantly in a circle or re-entering curve within which is the earth. The term "duration of her sidereal revolution" is used to describe the time which the moon takes to come back to a particular star. Early in the century the time was two thousand seven hundred and thirty-two days, a gradual decrease on all previous centuries since observation began, notably, by the Egyptian caliphs. The moon therefore must be getting nearer to us, and if the ratio continues for an infinite period, it will fall upon our globe. The moon is as surely falling to the earth, as the earth is surely falling to the sun; and a time must inevitably come when the words of Isaiah shall be fulfilled —

> "The light of the moon shall be as the light of the sun,
> And the light of the sun shall be sevenfold."

Or, in the words of John the revelator, looking down to the end of time, when the earth with its satellite shall have completed the stupendous changes of the future, and finished her course, —

> "Babylon is fallen; the great, the great; a woman
> Clothed in the sun, and the moon under her feet."

All moons may be regarded as dead worlds. As in human life there are premature deaths, so also of planets; they evolve from comets forming atmospheres causing them to revolve with a life of their own; but satellites having yielded up their moisture to the sun, become consequently airless and motionless. Falling into the wake or ether currents of other planets, they move around with

IDEAL SCENE ON THE PLANET MARS.

them, made stable in their motion by attraction and momentum, until they fall together into the sun's attracting fires. Chapter nine of this book contains an explanation of the cause of all axial and orbital motion of planets, by the action of the sun on their atmospheres; moons are all without atmospheres, therefore lifeless and dead, having no motion of their own save that imparted to them by their planet. Many of them perhaps never developed any very high forms of life; still their histories began as the histories of all planets, until came absorption of atmosphere, and premature death.

The moon shows clear evidence of geologic changes; craters, within the base of former craters, and mountain peaks on the broad summits of former mountains, with valleys or dried-up water-courses.

To the naked eye, we behold only the sun-lit portion of the moon's hemisphere, hence according to the moon's relative position around the earth, between our globe and the sun or in the opposite direction, is produced the phenomenon of the phases of the moon,—full, quarter, half-moon, etc.

So also of tides, caused mainly by the moon's attraction, assisted and accelerated to their highest points, when the attraction of sun and moon are acting in unison upon the same side or sides of the earth at the same time.

Mars, the fourth planet from the sun, and the first planet outward from the earth, is a body a little more than half the diameter of the earth. She is distant from the sun one hundred and forty million miles, and revolves on her axis in twenty-four hours, thirty minutes, and twenty-one seconds. Her year is six hundred and eighty-seven days. Mars has not only land, water, and snow like the earth, but is enveloped in an atmosphere

with clouds and mists. To the naked eye, Mars is distinguished by her fiery red light. Under the telescope, her waters appear of a greenish tinge, while her polar regions are draped in crystal white, contracting in her summer, and during her winter, like the earth, she extends a snow-covered landscape far into temperate zones.

Mars, representing as she does the sixth day of the history of all planets, is inhabited by a type of beings similar in kind and characteristics with those which existed on the earth in the mammalian era, prior to the advent of civilized man.

In her forests and tangled jungles roam mastodons, mammoths, and multitudinous diversified types of life, among which may be mentioned a great variety of orangs, monkeys, gorillas, apes, and chimpanzees of numerous types and species.

And a few races of savage men, with jaws protruding and animal aspects, hide in caves and cliffs of the rocks, while here and there a few have climbed upward to considerable intellectual development, and have learned the use of rude stone implements. And clustering wooden huts, with stone barricades in isolated places, prophesy the beginning of human progress.

Read chapter nineteen, "Sixth day of the world's history," and you will find described in detail the scenes and phenomena now taking place on the planet Mars. For according to our position, the planet Mars now represents the period of the earth's sixth day — the age of changing skeleton and coming brain.

Next in order outward from the sun, we come to the asteroids, a belt of small bodies, the largest of which are Vesta, Ceres, Pallas, and Juno, with one hundred and

IDEAL SCENE ON THE PLANET VESTA.

fifty others, that have been counted; and it is estimated that one hundred and fifty thousand of these small bodies actually exist in the gap between Mars and Jupiter.

The mean distance of these bodies is about three hundred million miles from the sun. They revolve in peculiar elliptic paths, rising and sinking from the general plane of planets. Vesta emits a bright light, and can be seen at night with the naked eye.

We shall regard all these bodies in the same light, and belonging to the same day or age. Whether these bodies had a separate independent origin, which can scarcely be supposed, or are the product of the division of an early nebula or comets, that once circled on the confines of our system, like the comet of 1877, dividing with many nuclei of fire, into many separate bodies, finally filling its path around the sun with the early embryos of these small worlds, or whether they are the product of a swarm of small comets; they are so similar in every characteristic, that we shall consider them in the sense of one planet, representing the fifth day of the history of planets.

They represent the reptilian age, the age of abundant chaotic life. Reptiles fill the marshes, lakes, and swamps, and winged fowl appear in the ethereal air—

"Which the waters brought forth abundantly."

Read the eighteenth chapter of this book, "The age of chaotic life," and you will find described in detail the present existing scenes and phenomena now being enacted on the asteroids, repeating as they do the fifth day of the world's history.

Going outward still farther, and leaving the sun four hundred and ninety million miles distant, and beyond

the asteroids two hundred million miles, we encounter Jupiter, the largest of the planets. She is eighty-nine thousand miles in diameter, and yet rotates on her axis every nine hours, fifty-five minutes, and thirty-three seconds. She is surrounded by dark belts which shift and melt into each other. Besides the belts, spots are sometimes seen mingling dark with fiery-red reflections; perhaps glimpses of underlying volcanic fires, seen through its rapidly rotating, and therefore striped atmosphere of clouds.

We cannot suppose that this stupendous planet is in every sense an organized world. We behold in Jupiter a revolving, bulky nebula, the waters of whose oceans are at this time falling vapor, and whose central core is yet flexible rock, bending in lightning waves to earthquake shocks and volcanic fires.

We shall hereafter show that the earth, in the fourth day of its history, was in like manner enveloped in belts and spots, when its atmosphere embraced much of the water of present seas, the black smoke of its coal-fields, and the carbonic acid gas of its carbon, since stored away in immense coal measures and other rock-strata of the globe; when, in short, the outer crust of this earth hung suspended in vapor, filling the firmament, over a damp hot-house landscape of carboniferous forests, with black clouds and dense watery vapors, thirty thousand miles in depth, making a planet nearly as large as Jupiter.

In like manner Jupiter's future oceans, her coal measures, and many other elements of her future crust, are now wrapped around her in a blanket of clouds thousands of miles in depth.

Turn to the seventeenth chapter of this book, the history of the earth's fourth day, the history of the age of

coal plants, "The age of coming blue and blazing sun," and you will find described in detail, mighty carboniferous forests, which at the present time clothe Jupiter's whole landscape, together with a description of the denizens of living forms which swarm and bask in her warm oceans, filling every lake and stream with varied moving forms.

It is the age and reign of fishes, while forests of rapid growth and prodigious size clothe all the landscape. In Jupiter is now being repeated the scenes of the earth's fourth day, beneath a blanket of clouds thirty thousand miles in depth.

Saturn next pursues a path four hundred million miles beyond Jupiter, and nine hundred million miles from the sun, around which she travels in ten thousand seven hundred and forty-six days.

Saturn is nearly as large as Jupiter, being seventy-nine thousand miles in diameter.

Like Jupiter, her surface is streaked with cloud-belts and bright spots ; but most remarkable of all, she is surrounded with a ring or rings, like the rim of a spinning-wheel, revolving around her, in the plane of her equator.

The substances of this ring are held outward by the intense centrifugal force of the planet, revolving as she does on her axis every ten hours and sixteen minutes. The distance of the inner edge of the ring from the planet, has been estimated to be about nineteen thousand miles, while its breadth, from the inner to the outer edge, is twenty-eight thousand miles, and its thickness perhaps not more than one hundred miles.

Behold this ring, a stupendous balance wheel, composed of cometous and meteoric substances, not altogether unlike the substances composing the Aurora

Borealis or comets, rotating at the terrible velocity of thirty thousand miles an hour, and we are not surprised at its existence ; we only wonder that it is not larger, and that more of the external atmospheric substances of the planet are not caught up by centrifugal force, and held outward in mighty revolving folds.

The distance of the second ring from the planet Saturn has diminished since 1657, and has doubled its breadth in the same manner ; in all probability the ring is closing in upon the central body of the planet, and will fall upon it in less than five hundred years. From this data it is probable that the axial rotation of the planet itself is decreasing, and that she will in time assume a position nearer the sun, in harmony with the decreasing momentum.

The seven satellites of Saturn revolve around her, on the exterior of the ring, and almost all of them in nearly the same plane. The two inner ones are seen like small bright beads on the minute thread of light formed by the edge of the ring. The three next are small, the fifth and sixth larger, separated by intervening distance increasing with each outer moon to the seventh, which is about the size of the planet Mars, and over two million miles from the body of Saturn.

These satellites may be the result of the condensation of independent comets, caught in the external ether currents of Saturn, and slowly evolving the world-changes of true planets.

According to the Nebular Hypothesis, as advocated by Swedenborg, Laplace, Comte, Herschel, and Pontecoulant, these satellites are the result of the breaking and condensation of former rings, which once encircled the planet in the orbits of the present satellites.

We will here remark that on the basis of the analogy of Saturn and her rings and moons, the whole Nebular Hypothesis has been built; and a theory in general accepted that similar rings once encircled the sun, from the substance of which all the planets have been evolved.

It is possible that Saturn's remaining rings may yet break up, forming satellites; but more probable, that with the condensation and contraction of the body of Saturn, and the lessening of her axial rotation, the matter of these rings will be precipitated in cometous folds, like the Aurora Borealis, in meteoric showers through her atmosphere upon the face of Saturn.

Saturn, like the earth, the sun, and all the planets, and every flexible rotating body, is not a solid but a hollow, concave globe, like the rind of an orange or shell of an egg. This is a law of natural philosophy, that all rapidly revolving flexible bodies become hollow spheres, the internal dimensions of which are proportioned to the rapidity of their rotary motion. This law frequently causes the explosion of rapidly revolving circular-saws, grindstones, and balance-wheels.

Saturn, the earth, and all planets having had their origin in flexible revolving matter, and being still flexible, rotating bodies, are therefore hollow; and internal matter is held outward against the shell by a force equal to that which on the exterior draws matter downward; namely, gravitation. The flood of internal fire, demonstrated by the ratio of increasing warmth as we go downward in the earth, increasing to intense heat and fusing the rocks into a molten floor deep down in the underlying strata of the globe; deeper still the increasing intensity of heat fuses the metals into vapors, and converts the centers into hol-

low, gaseous globes — another cause of the convexity of planets.

Saturn and the planets, the concave earth itself, differ not essentially from a drop of water suspended in God's sunshine, and revealing to us through the microscope infinite realms of life.

The planet Saturn, like Jupiter, is undoubtedly in an almost chaotic state, with perhaps an underlying core or shell of granite caging a central ball of fire, on the surface of which new-forming seas dash waves of warm water, wearing the granite into sediment, mixed with the dead protoplasm of an abundant animalcula and insectivorous life, springing spontaneous from the waters, and hardening with granite sediment into gneiss and slate.

Tempests and tornadoes stalk in grandeur over the mighty oceans, heaping the waters into mountain waves, or move in stately revolving columns on the flood. The warm water of the seas furnishes a vehicle for the germination and dawn of life, and majestic coral reefs stretch away in lines of beauty, covering vast areas by the wear and wash of waves with the débris of its substance; while mollusks in endless profusion heap shells upon shells, forming the substance of future strata of marble; which overlie the granite, the gneiss, and slate, and wrap the whole plain of Saturn with ribs of chalk, shale, and sandstone; and other limestone thousands of feet in depth.

Saturn's atmospheric envelope, the surface of which we recognize as the planet, is probably thirty if not forty thousand miles in depth, composed of oxygen and hydrogen, the true elements of air, together with a superabundant intermixture of carbon gas, mineral vapors, and dark clouds of poison, which render the existence of any

forms of air-breathing life impossible. It is the age of wearing oceans and the reign of shell-fishes.

Turn to chapter sixteen — third day of the world's history — age of dawning life, and you will find a description in detail of the scenes and phenomena now being enacted on the surface of the planet Saturn.

Uranus, the next planet, located nine hundred million miles beyond Saturn, and one billion eight hundred million miles from the sun, moving around him once in about eighty-four years, is computed to be thirty-five thousand miles in diameter, and if we can believe the authorities, rotates on her mighty axis once every seven hours; the probability is that these figures from the astronomers are over-estimated, and that her axial rotation is in harmony with her rotund form and motion around the sun.

Uranus is remarkable for the retrograde motion of her four moons, appearing to travel in a direction opposite the direction of the planet; located in orbits perpendicular to the orbit of the planet.

Uranus shines as a star of the sixth magnitude, and is just visible to the naked eye. On her surface is being enacted a terrific struggle between fire and water, grinding the granite foundation of the sea into fragments, and forming gneiss and slate, while boiling oceans emit dense vapors and steam, and the heavens give back their waters in one continued shower.

Read chapter fifteen — second day of the world's history — age of falling oceans, and you have a description in detail of the present existing conflict of elements now taking place on the planet Uranus.

Neptune, the most remote planet of the solar system, because of her immense distance, is invisible to the naked

eye. She revolves around the sun once every one hundred and sixty-five years, being distant from the sun over two and one half billion miles. The period of Halley's comet around the sun is seventy-six and three fourths years, and eight other comets whose periods are definitely known are much less.

Regarding the sizes of both Neptune and Uranus, there is among astronomers a conflict of opinion. We regard them in many aspects as similar to comets, stupendous fog-banks or globes of cosmic matter, the evolving products of comets, which having spent the fury of their fires, have cooled and contracted the trailing tresses into denser fogs. And Neptune now wraps in clouds the blazing heart of a molten sea of fire; and crystal flakes of granite are being precipitated like falling hail or fire-fly meteors, through a blanket of dark clouds thousands of miles in depth, slowly incrusting the molten pot of boiling rock with the foundation stone for future seas.

She is moving slowly in a career of untold cycles of ages, towards that future condensation, when a white floor of granite shall have caged the central molten flood of fire; upon which billowy oceans will surge, and life and animation mantle mighty landscapes yet to come.

Turn to the fourteenth chapter of this book, and read the record of the first dawning day of the world's history — the age of fire and falling granite, and you have the history of the transition of Neptune from a cometous sea of fire and vapor to a bulky embryonic planet.

We have made a rapid survey of the planets; from the aged Mercury, with step enfeebled, supported by staff; weighed down with the burden and mighty volume;

entombing in her rocks the history of all her ages ; from comet life and rich experience in the place of all the planets, to her present station on the border-land of time, soon to plunge into judgment and the abyss of fire. Queen and hero of all the wars, oldest sister and leader of the planets ; marching one by one, in solemn single file, with slow measured steps, toward the promise of brighter lands and happier realms beyond the sun.

We have seen them representing, each, a period and place of development on the shore of birth and death, inception and decay. Venus, the Earth, and Mars, dressed in manner of young or dignified womanhood following in the footsteps of Mercury, their more venerable sister ; the maiden Jupiter and younger sister Saturn, arrayed in plumage and wreaths and rings of flowers ; the child Uranus leading behind the baby Neptune, with tottering footsteps, mind all unformed, life all prospective ; scarcely dreaming of the tremendous ages, steps of infinite, varied history and experience, in the life and march before her ; to follow in the footsteps of all her older sisters, as one by one, weary with time, they make the sun their pillow, and fall into the sleep which knows no waking, the sleep of eternal dreams.

Behold them now, each in his respective place, the beacon lights and sentinels of all the ages,—

"Way-marks of two eternities."

It may be urged as an objection, that none of the planets have fallen into the sun, or any of them made any perceptible change in their positions for the last three thousand years, or since astronomic and scientific observation began. We fully appreciate the argument ; but three thousand years is a very short time, compared with

a full axial period, or day of a planet, which cannot be less than a half million years; further, we shall show that the epochs and changes in the positions of the planets probably take place in reference to them all at the same time, the whole planetary system unbalanced by the changing position of a single one. Therefore, the period of these tremendous epochs will be witnessed as in the past by all simultaneously.

According to the laws of the movements of planets as explained in chapter nine, when they have reached positions contrary to their revolving atmospheres, stopping first their axial rotations; while the planets struggling for a new equilibrium and a new axis of motion, in harmony with the motion of their atmospheres, will plunge reeling towards the sun. The earth's rotary motion for a time will stop, and with it day and night, until the universal turmoil and rotary tornado, holding the earth in its arms, has changed the very axis of the earth, forcing her forward in a new orbit around the sun. The crust of the earth will groan and burst in places, lifting higher former mountains, or sinking them into the bowels of the earth's molten sea. Earthquakes and numerous volcanoes will bubble up from the pot of central, agitated fires, and mantle the heavens in a black pall of cinders and ashes. Smoke and vapors will issue from craters and from crevices, while seams of fire, opening beneath and spanning the oceans, will send up mantles of black and gray.

The thickened air will become dismal in the lurid light of volcanoes, and lightnings' red glare, flashing dull amid the deafening turmoil and black sky of hanging gloom or melancholy's somber shroud; mighty tidal waves will ingulf numerous sea-port cities, and a cease-

less hurricane of rotary winds will establish the very earth on a new foundation, with new axial centers, and a new path around the sun ; the planet Mercury will plunge into his fires, Venus take the place of Mercury, and the Earth the place of Venus. Mars will take the place of the Earth, the Asteroids the place of Mars, and Jupiter the place of the Asteroids, Saturn the place of Jupiter, and Uranus the place of Saturn, and Neptune the place of Uranus. While amid the war and struggle of forces and of planets to regain an equipoise, reeling like drunkards in the unsettled heaven, in-coming comets will be attracted to the outer confines of our system, and dashed by the waves of an ethereal, surging sea into the form and place of Neptune. Then will have come the great and notable day.

"The sun shall be turned into darkness,
The moon into blood, and the stars shall
Withdraw their shining. Sun, stand thou still
Upon Gibeon ; and thou, moon, in the valley
Of Ajalon. Whose voice then shook the earth,
But now he hath promised, saying, Yea, once more
I shake not the earth only, but also heaven.
There shall be signs in the sun,
And in the moon, and in the stars,
And upon the earth distress of nations,
With perplexity ; the sea and the waves roaring ;
I will cause the sun to go down at noon,
And I will darken the earth in the clear sky.
And the stars shall fall from heaven,
And the powers of the heavens shall be shaken."[1]

[1]The above is a sample of our method of Bible quotations. Places where the parts can be found, are as follows : Joel 2 : 31 ; 3 : 15 ; Joshua 10 : 12 ; Hebrews 12 : 26 ; Luke 21 : 25 ; Amos 8 : 9 ; Matthew 24 : 29. Hereafter, to save space, we shall leave Bible quotations for a Bible study, as the parts are all contained therein.

CHAPTER VI.

THE SUN AND HIS CORTEGE OF PLANETS — HIS PAST, PRESENT, AND FUTURE — OTHER SUNS.

"All night the dreadless angel, unpursued,
Through heaven's wide champion held his sway; till morn,
Waked by the circling hours, with rosy hand
Unbarred the gates of light. There is a cave
Within, the mount of God, fast by his throne,
Where light and darkness, in perpetual round,
Lodge and dislodge by turns; which makes through heaven
Grateful vicissitudes, like day and night.
Light issues forth, and at the other door
Obsequious darkness enters, till her hour
To veil the heavens; though darkness might well
Seem twilight there; and now went forth the morn,
Such as in highest heaven, arrayed in gold,
Imperial; from before her vanquished night."

The sun, ninety-two million five hundred thousand miles from the earth, is eight hundred and sixty thousand miles in diameter, rotating on his axis every twenty-five and one third days.

A string of three hundred and forty beads the size of the earth would be required like the beads of a necklace to encircle the sun's waist. If we represent the sun by a globe two feet in diameter, a pea three hundred feet distant would represent the earth.

The sun is a body of gaseous, liquid, and partially stratified elements, surrounded with an atmosphere or photosphere of flame, and various metallic substances

THE SUN AT MIDNIGHT IN THE NORTH.

gasified by heat. The spectroscope has discovered oxygen, hydrogen, and nitrogen in his atmosphere, which surrounds him in various radiating degrees of density, for hundreds of thousands of miles, and the zodiacal light is a continuation of his outer gases.

The great gravitation and condensation of the substances composing the sun, in conflict with his fires, create on his surface a constant turmoil of mighty combustions, hurling immense bodies, like the scattered rock of volcanic eruptions, tens of thousands of miles from his surface, falling back into the fiery sea, to be again ejected by explosions as terrific as before.

The solar spots are great depressions or mighty craters, distending wide-mouthed openings in a sea of fire; like our cyclones, currents descend and carry down into the depths of the solar mass cooler material from the outer layers, with hydrogen and other gases, producing a decided extinction of light. At the base of these stupendous whirlpools, the hydrogen is re-heated, and rises in tremendous jets on the surface of the chromosphere. The velocity of these movements is incredible; an uprush at the sides or down-rush in the center has been measured, of sixty miles a second, a side-rush, or whirl, of a hundred and twenty miles a second. These tremendous cyclones continue from a few days to several months, covering regions of space into which the earth could be thrown like a ball of ice, without producing more than a perceptible bubble on the sun's surface.

The advancing sides of the sun's spots or open craters, have been observed to approach each other at the rate of twenty thousand miles an hour, and striking together in a rising pillar of fire, leap a hundred thousand miles into space.

On the day of the eclipse of 1858, a spot one hundred and seven thousand miles across was seen, and when the disc of the sun was totally obscured, flaming jets shot out on either side fifty and a hundred thousand miles into space.

These mighty pillars of fire fall again into the incandescent surge like the sea on pebbles; thus the sun's fires continue without sign of exhaustion or diminution.

We desire to make impressive the tremendous and awful fires composing the agitated sea of the sun. The mind cannot conceive nor imagination paint the fearful vortex. If we illustrate the sun's moving storms of fire by the earth's cyclones, whose greatest velocity of motion is no more than one hundred miles an hour, yet sufficient to wreck and lay waste villages and cities, mowing great paths through the forest and foundering with a shock the struggling bark; what shall we say of the sun's cyclones of fire, moving one hundred miles a second!

Should but the border of these tempests, coming down upon us from the north, touch the earth, it would in thirty seconds sweep the entire American continent from pole to pole, carrying before it the rock foundation side of our globe, with the cities of New York and San Francisco, Quebec and Mexico, not in scattered ruins, but in an indistinguishable earthquake and thunderbolt of flame.

Beholding these visions, in the sun, of an actual body in furious flame, and considering the fact that the earth is in the circle of the whirlpool of his vortex, moving steadily in periods covering eons of ages, approaching nearer and nearer the crater into which she must in the end fall, to be followed in after ages by each and all her sister planets, can we doubt the words of St. Paul and

St. Peter, or of Isaiah and the Revelation, of the time when —

"The heavens and the earth shall pass away,
The elements melt with fervent heat,
The earth also and the works that are therein.
And there fell a great star from heaven,
And a third part of the sun was smitten ;
Every mountain and island was moved,
The heavens departed as a scroll,
The sun became black as sackcloth ;
A woman clothed with the sun,
And the moon under her feet ;
Babylon is fallen, the great, the great,
And power is given unto the sun
To scorch men with fire !"

The sun's outer atmosphere in a sense extends to the boundaries of our solar system and the most remote planet, decreasing in density according to the law of gravity with the ratio of distance.

His outer atmosphere, like our own, to which ours is related, is transparent, save clouds in the form of the zodiac light, the Aurora Borealis, comets, and planets, all floating in his outer ethereal atmosphere.

We are in the arms of the sun, in his embrace, vivified by his light, warmed by his heat, and shielded by his love ; his mighty heart beats against the heart of the world, and our hearts ; and progress is written on all his planets, as they nestle closer to his bosom, and receive his inspiration and life.

Yes, that fire is divine. It is the porch lamp of God's own mansion ; back of whose light, heat, and effulgent glory, the Author of all creation, of every planet, and of the life which clings upon them, sits enthroned ; and his

crystalline, transparent folds reach outward, entwining and holding in their places the planets.

"God is love. God is light.
God is a sun and a shield"; —

the divine essence manifest in primitive substance, out of which has sprung the infinite creation with all its moving life.

It is said that space is filled with ether, an unknown substance and medium of light and heat, without which the sun's rays could not be transmitted to the earth.

This name is as good as any, but the element, however, which surrounds our sun and fills our system, reaching beyond the most remote planet, is the element of the sun's own exterior; belonging to him as the radiating halo of which the central scintillating red is but the product of condensation; the stratified, fiery nucleus of an ethereal sea extending beyond the confines of the remote planets; dense near the sun according to the law of gravitation, and more rare with the ratio of distance from the sun.

This ethereal substance which clothes the sun, embracing within it all the planets of our system, is the substance by which our sun reaches out and leans against other suns; — suns and systems of suns like the separate atoms composing the rain drop, leaning against and clinging to each other by the law of affinity, forming this stupendous galaxy of Milky Ways; the nucleated drops of whose water, each embracing a central sun, compose the atoms of that infinite sea, over the heaving billows of whose tempest-dashed waters, the infinite God walks in majesty, —

"Who maketh the storm a calm,
And the waves thereof are still."

The outer ethereal elements of the sun's own substance is the medium in which all the planets float like bubbles in air, near the sun or remote according to their density or specific gravity of the ethereal strata in which they live.

We shall yet show that the earth and all planets are hollow bodies, sustained centrally by the expansive properties of heat; — hot gaseous seas, holding outward shells of fire supporting ribs of granite, and a thin shell of stratified substance, surrounded with an atmospheric halo; — bubbles floating in the ethereal atmosphere of the sun; — blood globules, circulating in the veins of his life, and throbbing with every pulsation of his mighty heart.

This ethereal outer atmosphere of the sun, increasing in density from the confines of our system towards its center, is the resisting medium of comets; which driven from other systems by the accelerating force of momentum deep into the waters of our sun's atmosphere, cannot reach his central fires; but, carried by his revolving ether currents around him, are thrown back in sharp ellipses, like floats rising from the deep sea, or bubbles ascending in air.

And this is true of planets. They all occupy positions according to their density; the outer planets are great fiery, thinly-incrusted shells surrounded with mighty fog-banks of atmospheric or nebulous matter; as they become more dense, they assume positions nearer the center of all life; and finally, a broken, leaden, cold ball of dead matter, fall into his resurrecting fires — the sarcophagus, the marble, the tomb, the wrapped mummy waiting for the resurrection promised by the priests of long ago — the great world wrapped around with shroud, entombing her countless millions of sleeping dead — a charnal house and tomb of death, — all shall awake

again; every latent sleeping energy of the world shall spring forth into activity and life.

"Hail! holy light, offspring of heaven! first-born;
Or of the eternal, co-eternal beam,
May I express thee unblamed, since God is light;
Dwelt from eternity; dwelt then in thee,
Bright effulgence of bright essence Incarnate;
Whose fountain, who shall tell? Before the sun,
Before the heavens, thou wert, and at the voice
Of God, as with a mantle didst invest
The rising world of waters, dark and deep;
Won from the void and formless infinite."

From the sun we receive heat, light, and other principles which have not been clearly defined, clothing the world with verdure, painting the landscape with forest shades of green, groves of singing pine-trees; carpeting the hills with violets, opening buds, and ten thousand varied colors, sprinkled with smiles and blushes from shadows coy, sparkling with his own bedizened glory; while all nature animated with his life, assumes ten million moving forms, basking in his bright rays.

The sun, like a magic wand, touches our atmosphere, the winds leap to his embrace, coiling in mighty folds, bounding forward with the world in rapid rotary motion. The sun kisses the cold earth, and it blushes with foliage and flowers. He presses his glowing cheek against the world with light and warmth, and animates into life every feeling, moving thing. His heart pulsates against the world's heart, and intelligence, with deep feeling love, springs forth in the human brain.

He moves the winds, and white-sailed ships on ocean's broad expanse are wafted safely home. He chases away the shadow, the poison and malaria, of every

"Go Out and Stand, with Head Uncovered Like a Mountain, Among the Mountains." [125]

marsh, and wipes out with cleansing touch the miasm and pollution of swarming cities, then bids the winds to wash themselves in ocean's spray ; where, drinking the draft of purer moisture, they return with storm-capped clouds and water-falls, taught by his power to turn the wheels of human industry ; making possible the mill, with its multitudinous varied products,— its Lowells, its Manchesters. Yes ; the sun carried all this water to the hills !

The sun with amorous glance magnetizes the earth, joy leaps from every rill, health gushes from every spring. The sun conceived, and poured his life upon the forming earth, when it assumed multitudinous crystalline forms ; the rocks came, the oceans heaved their breasts, and foliage and flowers ran up the shoulder of the hills.

Surplus sun-light is found to-day in beds of coal and petroleum veins. We mine the coal, raise the oil, and with them convert water into steam, driving the locomotive on its track, and propelling ten million mechanical wheels. Thus the sun lends his mighty shoulder to the cause of human industry, turns the lever, and performs the menial labor of man.

Ten tons of coal which the leaves of long ago gathered from the sunshine, will shovel more sand than a man can shovel in a life-time, so if a man intends to spend his life in the mere use of his muscles, he had better dig ten tons of coal and set that to do the work, for it will be done more passionately, lovingly, willingly.

Our earth, with all its teeming, feeling, thinking, animate life, is one mighty, majestic monument of the sun's creative, sustaining power. God bade the sun create the world, supply the elements and vitalizing force of the progressing chain of its advancing life, and age by age the sun calls the world nearer home, teaches its heart

and brain new and grander lessons, prepares the soul of its multitudinous human life, accumulating into stupendous mines of sleeping force, covered o'er with mourning cloth of tomb and shroud, for future grander, mightier use. In the bosom of his light and life will yet be realized the undefined, longing hope of every human heart.

Behold the sun; — a relentless reservoir of the mightiest energies, with stupendous tornadoes stalking in the photosphere of his waters twenty thousand miles an hour, sending out spires of flame a hundred thousand miles in height; as unquenchable and inexhaustible as the subtle, acute conscience in the heart of man, his fires seethe and burn, flashing forth floods of scintillating life along the starry space.

From the strategic position which he occupies, he sends his power to every planet, and fills the vast circle above and around with light and love. He fills with glory not merely a dome above, but one below and on every side.

Go out and view that side of the earth mantled in his glory with sunshine, storm, or falling rain, building Columbia's proud Niagara, wreathed by his light in rainbow tresses and cloth of silver and gold; or stand like a mountain among the mountains with head uncovered, haloed in his light, and feel the immeasurable rush of his life. Look out into space, and behold the hanging planetary worlds, and trace all this to the orb of day — a sun sublime, profound of life.

The constantly recurring showers mean an annual fall of four feet of water on the earth's entire surface; lifting the hills and casting them into the sea would be a small thing compared with the sunshine lifting and transporting the water of the ocean, and pouring it in life-

giving showers on all the continents. You have heard the thunder, observed the eternal round of rainbows, and seen Niagara pouring out her majestic waters;—going back to causes, the sun from his car of crimson and palace of gold, with his drapery of sunbeams, lifted all this water to the hills. Behold the world itself, rocking and plunging among the stars, impelled by force and curbed to a pathway, and trace all this to yon sun's effulgent, scintillating power!

Lockyer has proven that the elements have been derived, and are but varied manifestations of, one primitive substance, which he designates as hydrogen. And it is certain that all space is filled with substance, whether hydrogen, oxygen, or a compound of known or unknown elements. There are no vacuums in the planetary spaces, no vacant spots in the infinite creation.

The sun's outer ethereal atmosphere of positive elements extends to the remote boundaries of our system, filling a circle beyond the orbit of Neptune. Yon center of light is but a center, and not the whole,—the nucleated center of the surrounding halo known as our solar system. The sun enwrapping his cortege and trail of planets, holds out a million arms of splendor, reaching out against the radii of other suns in their palisades of crimson and gold, alike draped in scintillating light. These suns with their radiating spires of life and light, rest upon each other, and are crowded together as compact as the drops of water composing the sea.

We are microscopic atoms, living on a world atom near the central depths of the sun; the center is red, the outer is azure; we look outward to Neptune in the azure, we look next into the fiery vortex, then look out into a river of surrounding suns, and mark the course of

currents among the stars. Our sun with his car and cortege of planets, is but a drop of the waters composing that infinite sea. Our world and the planets wrapped in the arms of the sun near his central vortex of light, are atoms which the Infinite views with his microscope, as in a drop of water.

The Milky Way is a broad river of suns; we view and contemplate only the central illuminations of the drops around us, the suns crowding upon and surrounding our sun; the bundle of stars fixed like jewels in the azure apple of night, are but a few contiguous drops in a mighty river of suns flowing onward through eternity.

> "And the great city of the new Jerusalem,
> A pure river of the water of life;
> In the midst of the street of it,
> And on either side of the river,
> Was there the tree of life."

At times may be seen on the surface of the sun luminous masses known as "foculea," and covering the main body of the sun's disc are oval-shaped bodies appearing like kernels of wheat; these grains sometimes unite in groups like broken portions of a thatched roof. We behold the cloud-belt, the foculea, the forming crust on the agitated sea hundreds of thousands of miles in depth, where liquids and solids, smoke and vapors, diffused metals, and lighter gases with spires of flame, are struggling for an equilibrium; like the war and turmoil of elements in the early ages of the forming crust of our globe, the conflicting elements of the sun are struggling to incrust, encircle, and chain with a shell his mighty heart of fire.

"You Have Heard the Thunder, and Seen Niagara Pouring Out Its Echoing Waters." [131]

On the surface of the sun is being enacted on a stupendous scale a repetition of the scenes of the first forming crust of the earth. The eternities will have wrapped his fires with ribs of granite. The earth, and all her sister planets, will have become foundation stones in his mighty pavement floor, when his light and heat shall have been caged, chained, and incrusted with a planetary shell, upon which lofty mountains will lift their heads to the sunshine of other stars, and intervening oceans dash their waves. Continents will heave their bosoms from beneath the tides, with hills and valleys, where winding, dreamy rivers will reflect the hues of silver, the gold and crimson of the light from other stars, and the shadows of trees and flowers fringing their borders. And forests of varied foliage will climb the summits of ten thousand hills, amid which will gush springs and rivulets of pure water, flowing onward to the sea.

Thinking, feeling, loving intelligences will ascend step by step the ladder of God's progress, mantling the sun with clustered cities, busy animation, and deep, purest love.

The planets revolving around the sun are but miniature prophecies of the sun himself; smaller in size, and remote from severe heat, the process of cooling has gone on faster. They are completing the evolutions of their histories, living the changes of birth, growth, development, and decay as miniature bubbles in the outer atmosphere of the sun, almost before his own history has begun.

But the sun himself has an eternity before him, a future of world phenomena, of animate intelligent life, of Christ-like purity and love. We behold in him the

final fulfillment of dreams, visions of the patriarchs and prophets, the realization of the philosopher's conception, the poet's imaginings, and the deep-anchored beliefs from the Christian faith.

God is mighty, and his plan beyond human conception, his wisdom past finding out. In the light of science, the book of Revelation shines with clearest light, its seals are broken, and they who run may read and understand.

> "And I saw an angel standing in the sun,
> And he cried with a loud voice, saying,
> Gather yourselves together unto the supper!
> And I saw the dead, small and great,
> Stand before God. The sea gave up the dead,
> And death and hell gave up the dead
> Which were in them. And the city had no need
> Of the sun, neither of the moon to shine in it;
> And there shall be no night there, and there shall be
> No more curse. Blessed are they who do his commandments."

CHAPTER VII.

THE STARS — CHARACTER, MOTION, SIZE, DISTANCE — PAST AND FUTURE.

"Thou, proud man, look upon yon starry vault,
Survey the countless gems which richly stud
The night's imperial chariot. Telescopes
Will show thee myriads more, innumerable
As the sea-sands; — each of those little lamps
Is the great source of light, the central sun
Round which some other mighty sisterhood
Of planets travel, — every planet stocked
With living beings, impotent as thee."

We behold in the sun a near star not essentially different from other stars; they all fulfill an analogous purpose, giving light and warmth, and animating with life planets which revolve around them.

That the stars or suns of the stellar heavens are fiery bodies, undergoing transformations and evolutions similar to the metamorphoses of our own sun or of his planets, there can be no doubt, and this is apparent in their changing appearances.

Sirius, the brightest of the fixed stars at the present time, produces a white light, but according to the ancient Egyptian records, he was formerly red. Castor and Pollux, the twin stars, were once the reverse of their present luster and brightness; one has increased, and the other diminished. In the days of Eratosthenes, Antares was less brilliant than either of the two stars in Libra.

Numerous similar examples might be cited, showing that great metamorphic changes are taking place in the remote suns or stars of space; and we infer that however vast the period of their full evolutions, birth, growth, development, and finally death and resurrection are as true of the stars or suns and systems of suns as of planets, of races, or of man.

In the Milky Way, alone, there have been counted twenty million visible suns, independent of others undiscernable.

It is useless to compute in numbers the immense distance from us of even the nearest fixed star. The sun is distant from us about ninety-one and one half million miles; if this distance be represented by one foot, even on this miniature scale, the distance of the nearest star would be over ten miles, while other remote stars and nebulæ would still be many million miles distant. Alpha, whose light travels at the rate of one hundred and eighty thousand miles in a second, would require four years to reach the earth, while it would require seventy-two years for the light of Cobra to travel the immense distance which separates him from us; and Herschel calculates that light would require eighteen thousand years to come from the remote stars distinguished with his twenty-foot telescope; while it would require sixty million years for the light of many remote yet visible nebulæ to span the tremendous distance from us. An artist with lens and camera plates, inhabiting the planets of these remote stars, would be compelled to wait the tremendous length of time of the above years to catch the pictures now embodied in the scenes of the earth. The story of Christ's crucifixion, travelling with the rapidity of light and with the complete painted imagery of surrounding details, has not yet reached the remote stars.

Could we reach the stars in the infinite distance above our heads, we would discover new stars as infinite as those we now admire.

But the domain of the Creator does not end even there: these are but the frontiers of the infinity of space. We should behold other immensities peopled with other incalculable worlds. And if our journey were to last for tens of thousands of centuries, we should never reach the limit which separates the universe and God. In the presence of such conceptions, calculation and poetry alike are dumb, and the boldest inquirer is awed into silence.

It is demonstrated that our sun, dragging with him his whole family of planets, of which we are a part, is travelling towards the constellation Hercules, at the rate of thirty-three thousand miles an hour.

The stars are divided into groups which form systems similar to our group of planets, — the simplest system constituting the double and triple stars; and there are other systems more numerous and complex, revolving and moving in reference to each other, each with a cortege or family of surrounding planets.

Many stars undergo periodical variations, and one in the neck of Cetus is bright for fourteen days, and then disappears altogether for three hundred and thirty days. A star in Cygnus is seen for five, then disappears for ten years; another star in the same constellation has a period of thirteen months. A star in the constellation Hydra is visible four months, and then recedes twenty months.

Such phenomena indicate great activity in the remote regions of space, and we again infer that evolutions and changes are taking place with them.

It is marvelous to contemplate that millions of globes, some of them many hundreds of times larger than

our sun, are moving through space without coming into contact with each other, at a speed far greater than that of a cannon ball. It can only be explained on the hypothesis that all space between suns and systems is as densely filled with force, visible or invisible, as the opaque worlds themselves, and that every square inch of space, apparently empty and still, is agitated by powers as terrific as Niagara's cataract.

Spectrum analysis, by enabling us to read in a ray of light the nature of the body which produces it, the elements constituting that body, and the changes that take place in it, becomes, as it were, a messenger from the stars; the confidant of infinite space, the telegraph from incalculable distance, the revealer of the closest secrets. In astronomy it has extended the dominion of positive knowledge over millions upon millions of leagues, and by it ascertained the character and elements of the countless luminaries which flash forth dots of light in the starry space.

In May, 1866, a brilliant star suddenly made its appearance in the constellation of the Coronæ Borealis, and shortly afterwards vanished; but the spectroscope by Huggins revealed the fact that owing to vast internal convulsions, enormous quantities of gas were emitted, and taking fire caused the light represented by the brilliant rays. The flame, raising the solid matter in the photosphere of the star to a white heat, the hydrogen was exhausted, the light diminished in brilliancy, and the star resumed its normal appearance. It should be borne in mind that owing to the immense distance of the star in which this fire took place, its light must have been at an end a hundred years or more before we were made acquainted with it.

The stars to the unassisted eye seem red, orange, or yellow tinted, and through a glass the additional colors of orange, blue, green, and purple, thus —

"One star differs from another in glory.

Spectroscopic analysis proves that these divers colors are produced by vapors in suspense in their atmospheres, and we know that the stellar atmospheres depend upon the elements and heat of individual stars; the stars have a function analogous to that of our sun; they are, like it, surrounded by planets which they keep in place by force of attraction, and which they illumine and vivify by their light and heat. So it may well be — and eminent astronomers have given such an opinion their sanction — that these distant regions are inhabited by beings intelligent like ourselves, capable of studying the harmony of creation, and of appreciating the power of its supreme Author.

The past and prospective future of our sun is the past and prospective future of all the stars in the firmament of heaven. The countless millions of stars appearing in the night like —

"Swarms of fire-flies tangled in a silver braid,"

occupy positions relative to each other, and form a globe or wheel, the Milky Way, — a majestic wreath or crown decked with shining stars. How typical of the majesty of Him —

"Whose forms robed or unrobed, he wears
Of awe divine," — whose thoughts they are.

Other Milky Ways have been observed so far remote that, seen with a powerful telescope, they at first appear to be a single star, a small circle of bluish light, and not until recently has the telescope resolved them into sepa-

rate dots,—mighty suns forming Milky Ways far off in stellar space.

Who shall say that the Milky Ways do not form an order as countless as the stars, encircling and decking the landscape of that Infinitude whose thought reaches beyond human thought,

"Whose word is from everlasting to everlasting"?

Splendid vision of the completeness and unity of the great whole! Oh! it is grand!

"Roll on, ye stars! exult in youthful prime,
Mark with bright curves the printless steps of Time;
Near and more near your beamy cars approach,
And lessening orbs on lessening orbs encroach;
Flowers of the sky! ye, too, to age must yield,
Frail as your silken sisters of the field.
Star after star from heaven's high arch shall rush,
Suns sink on suns, and systems crush,
Headlong, extinct, to one dark center fall,
And death, and night, and chaos mingle all:
Till o'er the wreck, emerging from the storm,
Immortal Nature lifts her changeful form,
Mounts from her funeral pyre on wings of flame,
And soars and shines, another and the same!"

CHAPTER VIII.

OUTLINE OF THE HISTORY OF THE BEGINNING OF THE CREATION OF THE EARTH.

"In the beginning God created the heavens and the earth."

Reader, let us go back in the eternities, to the time when the unconscious and unorganized elements of an uncreated earth hung suspended in the dark abyss of a boundless and voiceless expanse.

"And the earth was without form and void,"

existing, or non-existing in the eternal profound of unconsciousness. Here the homogeneous substances of a future world slept in silence and solitude, unthought, unfelt, and unperceived. In this deep of waters no light had ever shone, no heat had animated, no motion moved,

"And darkness was upon the face of the deep,"

and more than darkness in the awful depths of that sea of solitude, indistinguishable from nonenity.

Far off in the infinite expanse God had lit the dawning fires of our sun, and his light, heat, and motion were bounding with lightning speed on a mighty mission; and in them the invisible forms of Jehovah and Jove, sounding the blast of creation; the chaotic, invisible nebula of our world was touched with light, a nervous electric thrill broke the spell of eternal solitude, chaos trembled with the flush of heat,—

"And the Spirit of God moved on the face of the waters;"

the mighty deep was agitated by the first impulse of motion; unconscious matter sprung to conscious life, as when ether is touched with fire, the deep of waters burst into a sea of flame,—

"And God said, Let there be light, and there was light."

Combustion is motion, and the sea of waters sprung forth from an eternity of rest, leaping through space, impelled by a heart of fire.

A new and brilliant comet flashed athwart the sky; Mazzaroth in his season, and Arcturus with his suns, beheld the flaming orb,—

"And God saw the light that it was good."

Attracted by our sun, the comet sped forward as if leaping to his embrace; but the sun's rotary motion and surrounding currents of ether, radiating to the boundaries of our system, like the fence of a swordsman, held outward, around him, and threw backward in a sharp ellipse, the new-born world of fire. In this ellipse the comet moved for long ages, influenced more and more by the radiating ether currents of our system, slowly converting the ellipse into the natural orbit and circle of a true planet.

In the meantime the comet was spending the fury of her fires, and converting invisible nebular matter into tangible vapor, while oxygen and hydrogen gases wrapped all in a watery atmosphere; and the central core of fire was robed in a cloud-belt of blankets twenty thousand miles in depth, shutting out the sun, and holding a black sea of darkness against the sky.

"And God divided the light from the darkness."

Ages filed in single columns to their tomb, while crystallizing mineral showers fell in perpetual storm from the astonished sky, forming in the central depths a molten flood of granite.

Axial motion was established by the influence of the sun on the enveloping cloud-belt of vapors, and the metamorphic changes of an embryonic world gave place to a fixed and stable planet.

"And the evening and the morning were the first day."

There is nothing even now in the composition of our globe that cannot be reduced by heat to its primitive gaseous condition, and we shall show that the whole evidence of geology points backward to the original gaseous and fiery condition of the earth ; and chemistry is equally positive in proving a gaseous state as the original condition of every liquid and solid.

Let us imagine the early nebula out of which the earth was formed, by supposing the world melted down with fervent heat, her oceans, her mountains, her metals, her hills, and her rocks converted into gas. A pint of water will produce a hundred and twenty cubic feet of steam ; a pound of marble, or two pounds of coal, four hundred cubic feet of carbonic acid gas. Let us melt, burn, and convert into gas every liquid and solid composing the crust of the earth. In the place of a solid globe eight thousand miles in diameter, behold a nebula, three million one hundred thousand miles in circumference, a stupendous ocean of gas, reaching beyond and filling the orbit of the moon ; yes, let us melt, burn, and convert our satellite into a gaseous nebula, and with her ethereal substances form an independent external ocean, with a central nucleus of fire, and we behold the earth and our

satellite, a double comet, with two radiating tresses of phosphorescent splendor. Such was the condition of the earth and its satellite, far back in the past; in this condition they pursued their annual course for ages around the sun. It is possible, however, that our satellite may have had a separate independent origin, lived the evolutions of a comet and planet, finally yielding up her moisture to the sun, becoming a dead world, since caught in the ether current of our earth, to be carried on its shoulder until they fall together into the vortex of chaos and ruin. But we will leave our satellite, and follow the cooling and condensations of the forming earth.

This stupendous nebula, composed of mineral and other vapors, oscillated for long ages around the sun, combustion was slowly spending its force, and the quiescing elements exhausting their heat; heat was also radiating into space, a process especially marked at the circumference; and blankets of moisture, by a union of oxygen and hydrogen gases, began to form on the surface of what was still centrally a burning nebula. The water of all the seas, in gaseous clouds, hung suspended in the firmament, high above the fiery flood, surrounding and enshrouding the nebulous world; under its cooling influence, mineral gases began to precipitate flakes or crystals of granite, at first like the breath of a frosty morning, accumulating to tempestuous storm, or falling serene as the outpouring quiet of falling snow, or the precipitous beating of continuous hail, or illuminating the whole heavens in a more magnificent display of meteoric showers, falling from the circumference towards the center in obedience to the law of gravitation; the more intense heat in the central depths of the nebula melted, diffused, converted into gas, and again sent back by the law of

expansion, and fixed the circumference of the molten flood or liquid sea of rock in the place where now stands the granite, since cooled, crystallized, and hardened into the foundation crust of the globe.

The early crust of the primitive world formed farther from the center than at present, making a much larger and thinner shell, a natural result of solidification of the liquid surface of a slowly cooling body, sustained centrally by the expansive properties of heat; therefore the crust of the earth has always been proportioned in size to the measure of the intensity of internal heat.

During long ages the earth continued to cool, not only at the circumference, condensing and precipitating atmospheric vapors, but encroaching more and more upon the center; age by age the fiery pillars of the internal earth have contracted, refusing support to the external shell, and the breaking crust has fallen inward, to a new plane of balance; which is even now the explanation of earthquakes, creating thereby the rocky ribs of hills and mountain chains, and creating with each convulsion a smaller earth. Hence mountains on the surface of planets are marks of age, increasing in prominence and height as we approach the planets nearest the sun, even to Mercury, whose mountain chains are computed to be eleven miles high.

Roll on, thou world newly born,
Bleak thy surface, and void of life,
Dark the clouds that wrap thee round,
Storms lower and lightnings flash,
Fiery flakes of crystal stone,
From loss of heat precipitated,
Fall fast upon thy molten breast;
Ages roll, and deep miles of solid rock
Have formed for thee a giant shell—

A sure foundation for future seas,
An adamant base for all the hills.
Roll on, young world, ages on ages roll,
Cool down thy hot and fevered breast.
Aqueous clouds around thee form:
Ye hot, hissing, seething rocks
Be baptized with water of all the seas.
Roll on, young world, cool down thy brow,
Finish out your age with geysers;
Ye tempests surge, flash lightnings,
And pour o'er all your flooding waters;
Ages on ages roll, cool down, young world,
Heave your breasts, ye bending hills,
Ye mighty earthquakes, the mountains heave;
Lift up your heads! Oh! ye hills,
And ye oceans, find your place!

We have thus far traced the cosmos of the earth, from chaos to the dawn of geologic rock. Thus far we have built our history on isolated facts, our bark has been adrift in strange seas, but the compass of reason and logical causation has guided our course. Henceforth we can summon to our aid the testimony of the rocks.

But before closing this chapter, let us open the Bible, and see if our reasoning agrees with the spirit utterances of religion.

"His pavilion was dark waters and thick clouds of the skies" (primary condition of matter). "There went up a smoke out of his nostrils, and fire out of his mouth devoured." "He rode upon a cherub and did fly." "He maketh a light to shine after him as out of a seething pot or caldron." "He moveth his tail like a cedar, and the sinews of his stones are wrapped together." "Out of his mouth go burning lamps, and sparks of fire leap out." "A light doth shine, and his eyes are like the eye-lids of the morning" (the earth a comet). "By watering he

weareth the thick cloud, he scattereth his bright cloud." "With clouds he covereth the light." "He bindeth up the waters in his thick clouds" (birth of the chaotic world from a comet). "He bowed the heavens and came down" (condensation of nebula). "He commanded the sun not to shine by the clouds which went between" (the outer depths of vapor). "At the brightness which was before him his thick clouds passed hailstones and coals of fire" (rock crystals falling from the black sky into the cometous or fiery nucleus of the world). "He maketh the deep to boil like a pot." "He maketh the sea like a pot of ointment" (first and molten condition of granite). "Sharp stones were under his feet, he joineth them one to another, they sticketh fast together" (cooling and hardening of rock). "The hills moved and were shaken, whereupon the foundations of the earth were fastened" (breaking of the earth's early crust). "He made the clouds a garment thereof, and thick clouds a swaddling band for it." "In thick clouds he cometh down and gathereth the waters together." "Channels of water were seen, and the foundations of the earth discovered" (falling waters, cooling and forming the granite rock). "He thundereth marvelously with his voice" (earthquakes; struggle of fire and water). "He shot up his arrows, and scattered them" (terrific volcanoes of the early time). "The hills moved, and he said, Let dry land appear." "He shut up the sea with doors, and said, Hither shalt thou come, and here shall thy proud waters be stayed." "Great things doeth he, which we cannot comprehend."

CHAPTER IX.

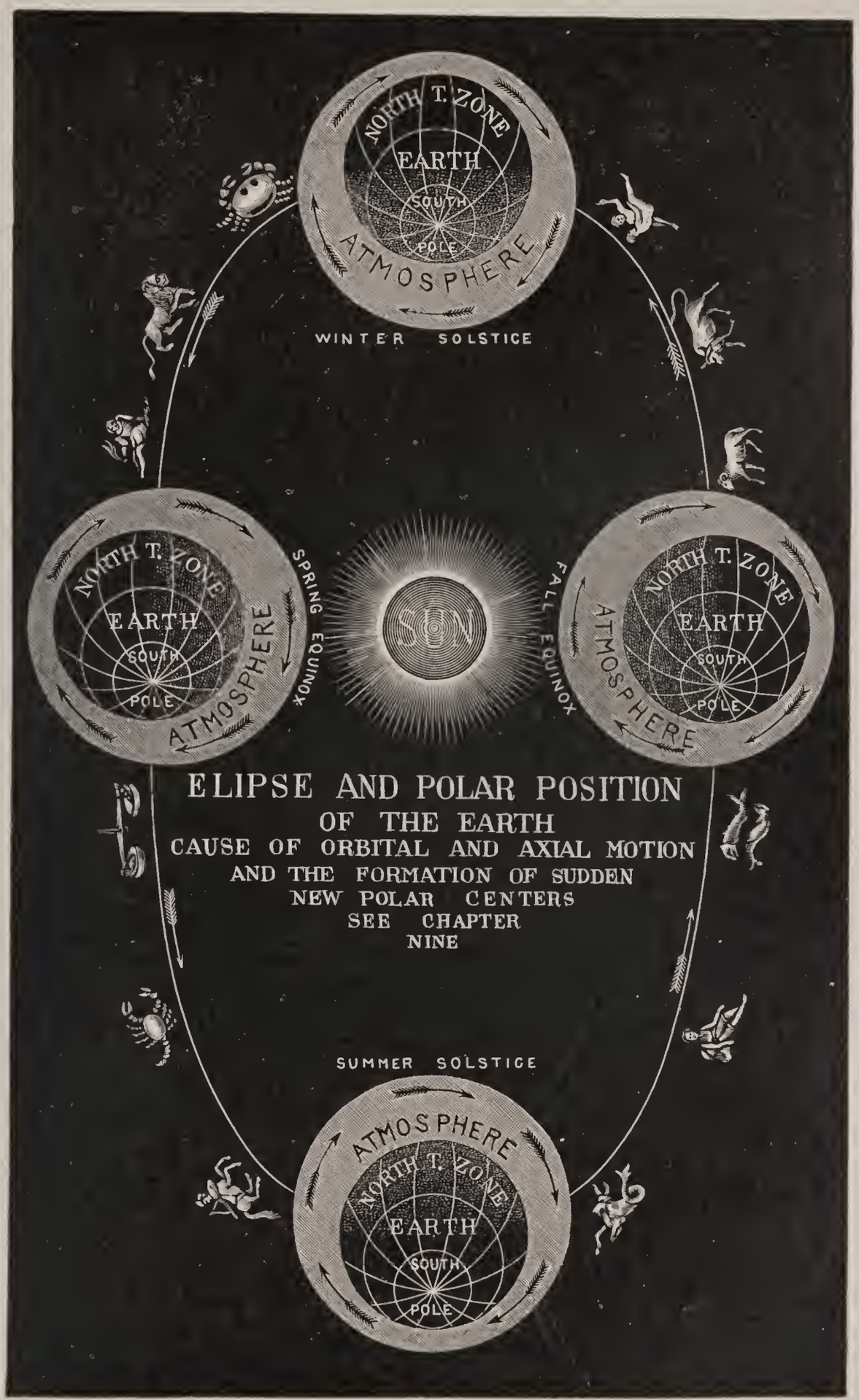
SUDDEN POLAR CHANGES OF THE EARTH — ITS CRUST BROKEN LIKE A CRUMBLING SHELL — THE DELUGE — A KEY TO MANY THINGS IN THIS BOOK.

"He shaketh the earth out of her place,
And the pillars thereof tremble;
He treadeth upon the waves of the sea,
And overturneth the earth."

Dana has well said, "An atom in immensity is immensity itself in its revelations of truth, and science gathered from our small sphere is the science of all spheres." In like manner by observing the phenomena of the present, we learn the history of the past and foresee the future. We therefore invite the reader's attention to the study for a moment of a mechanical principle which will throw floods of living light upon what has been inexplicable mystery.

Why does the earth revolve on her axis, producing every twenty-four hours, day and night? We have shown in a general way that causation is eternal, but let us observe more closely the chain of causes which impart motion to the earth.

Heat expands, and cold contracts; this principle applies to the earth's atmosphere. The sun shines upon one side of the earth only, consequently expanding the


NORTH T. ZONE
EARTH
SOUTH
POLE
ATMOSPHERE
WINTER SOLSTICE
SPRING EQUINOX
SUN
FALL EQUINOX
ELIPSE AND POLAR POSITION
OF THE EARTH
CAUSE OF ORBITAL AND AXIAL MOTION
AND THE FORMATION OF SUDDEN
NEW POLAR CENTERS
SEE CHAPTER
NINE
SUMMER SOLSTICE

atmosphere on the side of his rays,[1] while the opposite side is cooled and contracted. Suppose the earth did not revolve on her axis, how great would be the condensation of air on the side of perpetual night, how much its expansion on the side of perpetual sun! If one hundred miles represented the depth of air on the side of perpetual night, one thousand miles would scarcely represent its depth on the side of perpetual sun.

It was Archimedes who said that with a lever long enough, he would move the world; we have in this law a mighty leverage power to do something.

Suppose the earth did not revolve on her axis, would it be possible for the atmosphere to remain motionless? Would not the cold, dense winds of night move in steady currents towards the land of perpetual hot sun, where, expanded by his rays, they would rise far upward, and again seek to find a level by moving in opposite directions? This would be the case if the earth had always been motionless and a perfect globe, but beginning with motion, and broken as is her surface with hills and mountains, such atmospheric currents could not long remain balanced, but trembling between adverse influ-

[1] The atmosphere of the earth was formerly supposed to extend upward only about forty-five miles. It has been recently demonstrated, however, that it extends upward and surrounds the earth to the depth of five or six hundred miles, decreasing, of course, in density as we go upward.

One can form an idea of what we mean by use of the term "expansion of atmosphere under the rays of the sun," by the following experiment: Hold a piece of burning paper under an inverted glass tumbler, and when the inclosed air is thoroughly heated, quickly place the tumbler, still inverted, in a saucer of cold water. The inclosed cooling and contracting air will draw up the water, and nearly fill the tumbler. The expansion of air on the sun-lit side of the earth and condensation on the other, is the Herculean power which causes the earth with its atmosphere to revolve.

ences, move in one direction around the earth, the whole atmosphere pursuing a circuitous, uniform motion around the globe.

This is the exact scientific truth; the whole atmosphere of the earth moves with a terrific velocity from west to east, sweeping at the rate of twenty miles a minute, a speed more rapid than that of a cannon-ball; making a complete circuit around the earth every twenty-four hours. It would be impossible for the earth to remain motionless acted on at every point by this mighty force. One steady hurricane sweeping over her plains, uprooting her forests and wrecking her mountains; this is the force that causes the earth to revolve on her axis.

In other words, the heat and light of the sun compel the atmosphere to revolve, and the atmosphere holds the earth in its embrace, causing her to revolve in unison; hence the terrific motion of the earth's atmosphere is imperceptible to us.

The tendency, however, of the atmosphere is to move faster than the earth, as the general direction of trade-winds is from west to east; this is true also of the ocean currents, by the friction of atmosphere, modified like the trade-winds by the location of islands and continents.

Let us now explain the cause of the earth's orbital revolution — the reasons why the earth revolves around the sun every three hundred sixty-five and one fourth days. In solving these problems, floods of light will come in.

We have seen that the atmosphere revolves with the earth every twenty-four hours, and that it is forever expanded under the sun's rays, and eternally contracted on the opposite side; therefore the volume of expanded

air is forever moving towards the east side; while the heavier volume of condensed air is eternally coming in, on the west side, creating almost a vacuum on the one side, a weight on the other, like a mighty wedge, with terrific force, forever inserted on the one side, and as perpetually withdrawn from the other. This force carries the earth around the sun every three hundred sixty-five and one fourth days; for let it be remembered that space is filled with ether, without which it would be impossible for wave motions of light and heat imparted by the sun to reach the earth.[1]

If these are the true causes of the earth's axial and orbital motion, it will follow that the greater the amount of a planet's atmosphere, relative to the size and weight of the central solid, the more rapid will be the planet's rotary motion, also her forward movement around the sun; and the more rapid a planet's axial and orbital motion, relative to size and weight, the greater its distance from the sun.

[1] Planets revolve, but comets do not. Planets have a central globe or shell which comets do not have. The atmospheric portion of planets is forever expanded on the side presented to the sun and condensed on the other, causing a circuitous motion of atmosphere around them, and therefore their own axial rotations. The rotund nucleus of planets, and which comets do not possess, is the reason why planets rotate and comets do not. The sun expands comets, as it does our atmosphere, when they approach him, and therefore becoming lighter, they rise in the ether or medium in which they float; by this force driven outward from the sun, they are again cooled and contracted, becoming heavier, relative to the medium which supports them. Hence the motion of comets is always that of an ellipse to and from the sun, carried around the sun, by his axial rotation and the rotation of the surrounding ether. Such would be the movements of the earth with her atmosphere, were it not for the rotund shell; her whole substance as a cosmos would be expanded by the sun's rays, by which she would be driven outward from him; when cooled and contracted, she would oscillate again towards him, pursuing an ellipse like all comets around the sun. Such would be the motion of the earth were it not for her rotund shell, around which, impelled

This principle holds true with all the planets; those with less atmosphere, like Mercury and Venus, revolve near the sun, while the planets composed mainly of nebula, or atmospheric matter, like Saturn, Uranus, and Neptune, pursue paths the most remote from the sun.

Undoubtedly the ether currents imparted by the sun's own rotary motion was the original cause, and still accelerates the motion of all planets.

The ether, or medium of light and heat from the sun to his planets, is in a sense the transparent outer envelope of the sun himself, decreasing in density like our atmosphere, with the ratio of distance, and extending far beyond the most remote planet. This is the resisting medium to comets, and the substance in which the planets float, with distance from the sun measured by their specific gravity; the bulky, nebulous planets occupying positions remote from the sun, and the more dense, like Venus and Mercury, positions near the sun.

Let us now explain the cause of the earth's elliptic day, and the consequent sudden change of the earth's polar axis.

by the sun, the atmosphere revolves, forever expanded on the side towards him, and forever contracted on the other, causing by the rotation of atmosphere the earth to revolve on her axis.

When a comet has formed a central rotund shell, sufficiently fixed and stable and of sufficient dimensions to obstruct the sun's rays, and allow expansion of atmosphere on the one side and contraction on the other, a circuitous motion of atmosphere around that body is the result, and the globe, wrapped in the arms of its atmosphere, commences axial rotation and orbital motion around the sun.

Such is the transition stage or birth of a planet from a comet, and such transitional periods have been witnessed by each and all the planets, not alone in the formation of a nucleus or rotund crust, nor in the condensation of the cometous nebula, but also in an entire change of motion. The eccentric, wild, wandering course of the comet ceases; the embryonic days are passed, the evolving germ in the womb of nature is born to life; a planet with revolving tread and proud, conservative motion, commences her long career around the sun.

The revolution of the atmosphere around the earth would naturally fix the earth's axis at right angles to the sun, and carry the earth in a perfect circle around him, for the earth's upper atmosphere is always revolving in a direct line towards the sun.

By the slightest nodding of the earth on her poles, attracted by other heavenly bodies, she would be forced to the commencement of an elliptic orbit, and the ellipse would increase with the ratio of polar displacement.

When the earth once began to deviate from a circle, in obedience to the dipping position of her poles, momentum would increase the displacement at a given ratio, consequently increasing the variance of axial rotation from that of the revolving atmosphere, for the upper atmosphere always revolves in a direct line to and from the sun, regardless of the earth's axial rotation.

At the equinoxes the earth and her atmosphere revolve together in harmony, but the earth, driven on by the peculiar position of her poles, soon changes her position relative to the sun, and relative also to her own revolving atmosphere, which soon revolves diagonally around the earth, crossing the equator.

When the earth and her atmosphere revolve in unison, their motions are imperceptible to us; but when they diverge, it gives rise to currents of air apparently moving either north, south, or otherwise, according as the motions of the earth and its atmosphere diverge.

With other modifying causes, the varied winds on the surface of the earth can be explained on this hypothesis.[1]

[1] The weather prophets of the future will not be dreaming somnambulists, but as scientific, exact, and unerring in their predictions of wind and weather, storms and tornadoes, rains, sunshine, heat, and cold, as the astronomers are

When the earth shall have dipped on her polar axis to an angle of more than forty-five degrees, creating a wide deviation between her rotation and the rotary motion of her atmosphere, the earth's momentum must yield to the atmospheric forces, changing her polar centers, and forming a new axis of motion.

Hence the earth is carried for ages in a constantly increasing ellipse, in accord with her dipping axis, until her position and rotary motion are so widely in conflict with the revolving motion of her atmosphere, that the earth's momentum is overthrown, and the earth's rotary motion righted to the revolving motion of her atmosphere by a sudden catastrophe, changing the axis of the earth, and forcing her in a new orbit around the sun.

We cannot believe in the theory of M. Lanard, that the earth slowly oscillates from pole to pole by the weight of accumulating ice, although accepted by Darwin, Hooker, and other scientists. If the earth has changed, or will ever change, her center of motion, it must be by some sudden catastrophe. Every law of momentum would compel the earth to revolve on established centers, long after the earth's atmosphere was revolving widely at variance with her motion.

It is a conceded fact that storms and tornadoes move not in straight lines, but in the segment of a circle. A giant timber "windfall" through Northern Wisconsin, on the average three hundred feet wide, and more than sixty miles in extent, is as exact a part of an immense circle, as if a giant wheel, like the ring of Saturn, rotating around the earth, deviating from the earth's motion, had dipped down and touched the landscape.

The atmosphere holding the earth in its embrace, revolves rapidly around it, and is the cause of her rotation; but the motion of the atmosphere never deviates from a direction towards the sun, while the earth oscillates in her revolving motion from north to south, from south to north, from summer to winter, and from winter to summer, causing every deviation of wind. When this subject shall be thoroughly understood, the predictions of scientific weather prophets will be unerring and exact.

When the earth shall have tipped on her axis to an angle of more than forty-five degrees, the earth's momentum must yield to the new line of atmospheric currents which always pursue a course in a straight line towards the sun, like the revolving rings of Saturn always towards the sun.

In the present ellipse of the earth the sun virtually crosses the equator at the spring and fall equinoxes, shining straight down on the north temperate zone in July and August, and straight down on the south temperate zone in January; hence in July the earth's atmosphere pursues a course diagonally around the earth from the north to the south temperate zone, and this is true in a reverse order in January. The upper currents of air are forever moving in a wheel perpendicular towards the sun, regardless of the earth's axial positions.

When the earth shall have dipped on her axis to an angle of more than forty-five degrees, a sudden reconstruction of axis will be the result; then woe to the inhabitants of this earth, in the language of Job,

> "When he causeth a mighty wind to blow,
> When he treadeth upon the waves of the sea,
> When he overturneth mountains in his anger,
> When he sendeth out his waters
> And they overturneth the earth."

The field we explore being a new one, and astronomical observations, relating to polar positions and eccentricities of the earth thousands of years ago, being meager and uncertain, it is impossible to arrive at definite figures as to the time required for the earth to complete her tremendous circle,[1] or what period in the future, when

[1] The north star deviates one degree in about seven hundred years, and it is computed that in one hundred and twenty-eight thousand years, the great star Vega will have become the north star. In the possession of the

the earth shall have arrived at a fatal inclination, does not admit of more than an approximate guess; the greatest polar displacement of the earth is not yet more than twenty or twenty-five degrees.

Assuming the figures of Darwin, Mr. Croll, Dr. Hooker, and other geologists to be correct, who place the last glacial epoch at two hundred and forty thousand years ago; and assuming that the glacial era was the commencement of the earth's present orbit, the result of her last polar displacement; assuming also that it has required the above period of time for the earth, dipping on her poles, at a given ratio, to change her position from an equatorial line towards the sun, to the present angle of twenty degrees displacement,—it will require another period of at least two hundred and forty thousand years from the present, before the earth, in her slow changes, shall have reached the fatal angle of forty-five degrees and fatal polar inclination.

On the subject of the above reckoning, we are not dogmatic; believing, as we do, that the tremendous crisis of an axial and orbital change, by some other planet may be precipitated upon our system, involving the earth in the necessity of the establishment of a new axis and a new orbit around the sun, before the earth itself has reached the fatal polar inclination.

Mars or Jupiter may arrive first at a fatal polar inclination, and reeling like a drunkard from his orbit, involve

equinoxes, the equator meets the sun a little earlier each year. Two thousand years ago, in the time of Hipparchus, the sun at the vernal equinox was in the constellation Aries. At this present time, when the sun crosses the vernal equinox, he is in the constellation Pisces, and two thousand years hence at the vernal equinox he will be in the constellation Aquarius. Consequently, the earth, year by year, is changing her position relative to the stars. Such are the established facts of astronomy.

the whole planetary system in the unbalanced crisis of rotary and orbital changes.

A sudden change of orbit and axis, brought on aforetime, by Mars or any other planet, the consequences to our world will be less disastrous and appalling, than if by the lapse of a longer period the earth itself arrives at the fatal angle of forty-five degrees, necessitating a change in her rotary motion and position almost from pole to pole; a circumstance that would involve as general destruction of life as in the last great deluge; breaking like a crust the earth's very shell, to emit fire and lava from every seam, accompanied by a tremendous rotary hurricane, tidal wave, and flood.

Should the catastrophe be precipitated prematurely by another planet, the consequences will be less severe, yet appalling. Smoke and ashes, fire and cinders, will issue from a thousand old and new volcanic craters; steam and vapors, arising from fiery contact, will obscure the sun and darken the heavens, and the agitated oceans will hurl their waters in mountain waves over the islands, and break down the rock-barriers of the shores, ingulfing numerous cities. A premature crisis, involving the earth, brought on by another planet, is clearly declared by numerous passages running through both the Old and New Testaments.

> "Except those days should be shortened,
> There would no flesh be saved; but for the
> Elect's sake, those days shall be shortened;
> Stars shall fall from heaven. For I shake
> Not the earth only, but also heaven. The sun
> Shall be darkened, and the moon shall not
> Give her light. The earth shall reel to and
> Fro like a drunkard. The sea and waves roaring.
> He will smite the great house with breaches;
> It shall be drowned as by the flood of Egypt."

Philosophy, however, assures us that the unbalanced earth will settle down again from the appalling disaster, on new axial centers, in a new and closer orbit around the sun, the source of all life and advancement. Then will have begun the eighth day or epoch in the history of the world, which will develop a serenity and beauty unknown to the present; the human brain and the human heart will respond to the divine influx, with its rays of light and love; and the final result is also pictured by numerous paragraphs in the Old and New Testaments.

> "The light of the moon shall be as the light
> Of the sun, and the light of the sun shall be
> Seven-fold in the day the Lord bindeth up the
> Breech of his people, and healeth the stroke
> Of their wound. Lift up your heads, for your
> Redemption draweth nigh. Knowledge shall be
> Increased. The Lord God will cause righteousness
> And praise to spring forth before all nations."

Were it not for the complications of the world with other planets, scientists might discover data upon which accurately to determine the time, as did the ancients, when Noah and his family entered into the ark.

This is a subject of tremendous importance to future generations, to ascertain the exact time and prepare for the approaching catastrophe.

> "Of the day and of the hour knoweth no man."

The moving polar inclination of the earth is slow, and her deviations, relative to the sun, can only be recognized by comparing widely-separated ages; for between the catastrophies, when the earth has changed her polar axis, lie the tremendous periods of time which have been the "seven days" of that eternity since God began the

creation of the earth. With him time is marked by great revolutions in events, cycles of mighty ages,

"Way-marks of two eternities."

The geologic evidence that the earth has six times changed her polar centers; the intervening periods representing long ages, will be overwhelmingly demonstrated when we come to deal with geology.

For the present, we will confine ourselves to the proofs of the last change in the earth's axis, the evidences of which are clear, and leave no room for doubt.

But first let us inquire, What would be the results to the earth, consequent upon a sudden change of her axis and rotary motion?

The earth is twenty-six miles further through her equatorial than her polar diameter, caused by her rapid axial rotation, drawing the poles together, and bulging at the equator. By this force, the Mississippi River is driven up a hill, nearly three miles high, at a very rapid rate,—its mouth being that distance further from the earth's center than its source. If the world revolved faster, the oceans would rush to the equator, burying the tallest mountains, and leaving the polar regions bare. If the world should rotate more slowly, the poles would be submerged, and the equator become an arid waste.

A new axis, suddenly established in temperate regions, and the consequent bulging of a new equatorial belt, perhaps encircling former polar regions, would change, accordingly, the line of centrifugal force, and carry the oceans of the old equator in mighty floods to the new. The pressure of the earth's internal fires would, therefore, become unbalanced from without, and the whole crust of our globe broken up and distorted; conti-

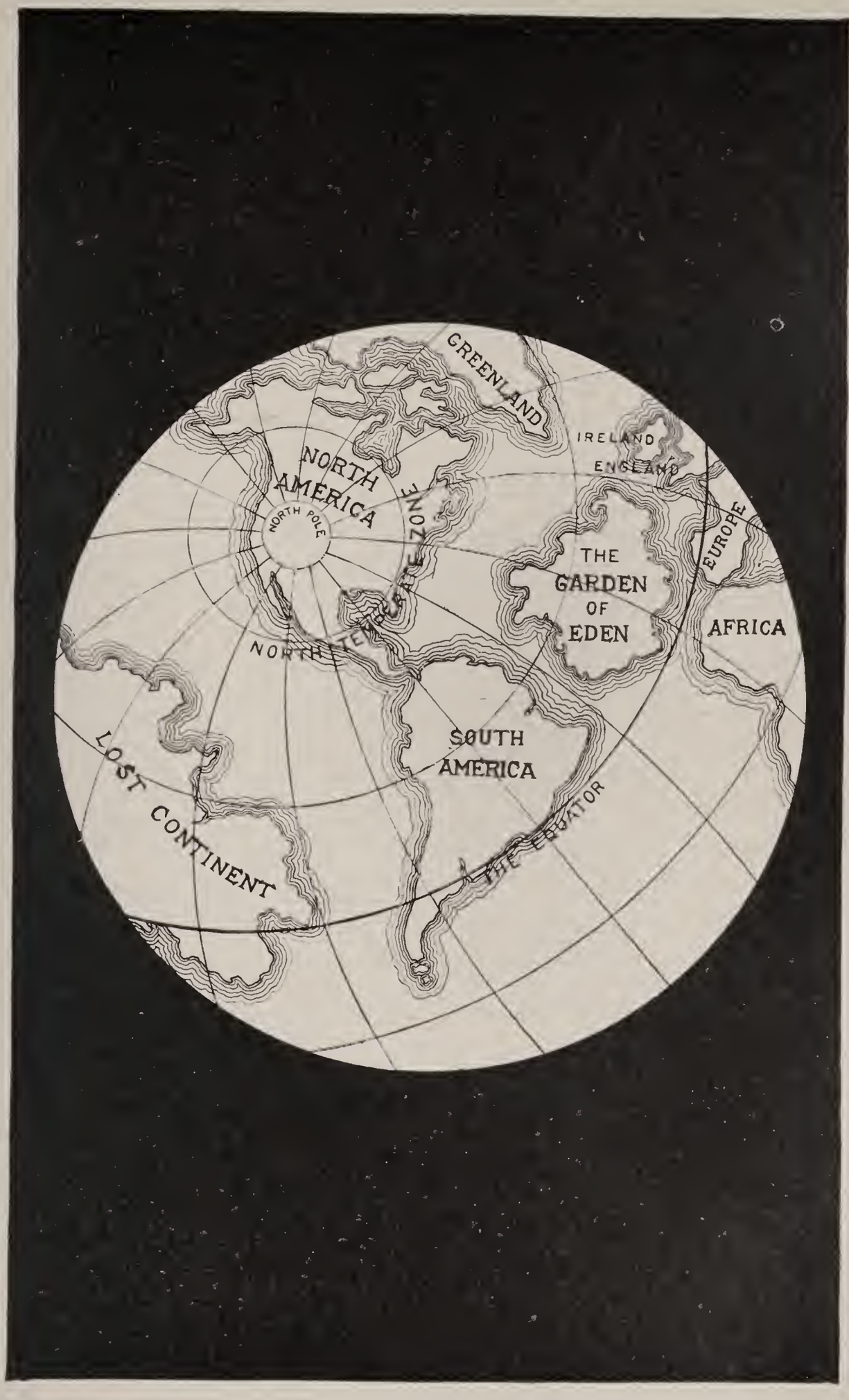
nents overrun with flood and fire; mountains upheaved, or sunk forever into the bowels of the earth's molten sea; old polar continents, brought suddenly under the glare of a genial sun, and flooded with water from the hot equatorial regions, would cause a mighty glacial epoch; while icebergs would be transported, loaded with boulders, far off into other waters; and melting, discharge their contents; while the new polar regions, located perhaps in old tropic or temperate zones, would be overtaken with sudden cold,—life destroyed and stiffening with the blast of a terrible winter, preserved amid continents of forming ice.

By our studies of the earth's orbital, axial, and elliptic motions, we have found the key which unlocks a thousand mysteries.

Here is the explanation of the sudden transitions of the geologic ages; the evenings and the mornings of the "days" of God's handiwork in the creation of this earth.

Here is the explanation of that mysterious "glacial epoch," when, according to Agassiz, Dana, Lyell, Hitchcock, and others, New England was buried deep in ice; and even the Middle and Southern States, chiseled, as if overrun with huge plains of ice; the canyons of the Rocky Mountains cut deep by undercurrents of water, issuing from overlying strata of ice; boulders and drift carried and deposited far off by melting icebergs.

This ice accumulated when the United States, with its center in the State of Utah, was a polar region. The precipitation of salt, as the result of continued freezing of the waters of the old alkaline oceans and later evaporation, has left in Utah immense salt seas and beds of salt; and distributed through Colorado, Kansas, Montana, Dakota, and Nebraska, various alkaline deposits pointing



THE EARTH BEFORE THE DELUGE, WITH THE THEN NORTH POLE IN THE STATE OF UTAH.

back to her age of arctic cold, polar ice, and a salt sea birth. The upper strata of earth, in these States, also contain, in abundance, the fossil remains of polar fauna and flora, which are distributed also, more or less, in all the surrounding States.

Here is the explanation of mastodons, elephants, and other tropical animals exhumed from the ice of arctic regions, in such a state of preservation that dogs feed on their flesh; and it has been recently discovered that our own Alaska is a burial-ground of tropical animals; the earth, in places, being literally covered with petrified bones of elephants and mastodons that once inhabited the hot clime.

These ice-entombed Siberian mastodons and elephants, as well as the Alaskan fossils, inhabited only tropical climates, subsisting on tropical vegetation, which is also exhumed, both frozen and fossil, in abundance with them.

Greenland's icy mountains, with all the ice-buried continents of the north, were once covered with verdure, where grew the banana, palm leaf, and fern; under whose genial skies myriads of living things sported in their happy existence; among the tangled brakes of whose hot, marshy forests mastodons roamed, the undisputed kings.

During this period in the history of the past, the then north temperate zone was the belt of a high human civilization, as written in the ruins of South America and Mexico, and traditions of the lost isles of the Atlantis, with its Garden of Eden sunk in the Atlantic Ocean. But more anon.

Perhaps the grave of human civilization lies buried beneath the polar continents of ice and snow, fenced in by the barriers of frigid cold, beyond which human daring

and self-sacrificing bravery cannot pass; sacred these graves from the desecration of man.

Who shall touch the wand of science, and compel the ice-covered antipodes of our world to give us back the story of their balmy days?

Here is the explanation of the traditions of every race and people, of every tribe and tongue; reaching back through the dim vista of ages to the threshold of recollections in human aforetime; when the windows of heaven were opened, and the bowels of the great deep broken up, and God said,

> "Behold I, even I, do bring a flood of water
> Upon the earth to destroy all flesh wherein is
> The breath of life from under heaven;
> And everything that is in the earth shall die."

Old ocean breaks from her rock-bound barriers, and rolls death-dealing waves in multitudinous mountains; ingulfing continents, cities, civilizations; tiny birds and the denizens of the forests, are alike overtaken and ingulfed in the universal maelstrom of flood and fire. The bowels of the great deep emit sulphurous flame and poisonous gases, and the inhabitants of the sea perish in countless millions, leaving huge beds of their fossil remains, piled in strange discord, in evidence of a violent death.

Perchance some strong-built ship, freighted with a few precious lives, rode above the swelling billows, heroically battling with the elements of death; putting their trust no longer in the loadstone needle, which fluctuates wildly and excitedly, as if in deep feeling and sympathy with the surrounding turmoil and death; but guided by some Bethlehem star, land after many days in a new clime and country.

"Make thee an ark of gopher wood;
And Noah did as the Lord commanded.
And the ark rested on the seventh
Month upon the mountains of Ararat."

Howsoever, portions of the earth would escape where crossed the old and the new temperate and tropical belts; here life would be preserved and perpetuated from age to age, in spite of these terrible catastrophies of nature.

With these great convulsions, which the earth has already witnessed a number of times, dividing the long epochs of her history into the "seven days" of Genesis, she has taken positions nearer and nearer the sun, having assumed a new axis, at the perihelion of her ellipse, at which point she has begun each new circle and orbit around the sun.

These new positions have been caused by the lessening of the earth's atmosphere and consequent increase of the solid bulk of our planet, through the growth of vegetation, feeding on the carbon of air; and other condensing causes have slowly formed the oceans and solid crust of the globe out of a primitive and chaotic nebula. And as our atmosphere becomes still more ethereal by the deposit of its gaseous elements through vegetable growth into solid earth, she will assume positions nearer the sun.

This is true of all the planets; they are moving in a round of infinite changes of birth, growth, perihelion, and, finally, of death and dissolution in the sun.

CHAPTER X.

CHEMICAL BASIS OF LIFE — MAN'S MATERIAL CHEMISTRY IS GOD'S IMMATERIAL GEOMETRY.

"And I saw a pure river of water of life
Proceeding out of the throne of God."

Behold the frost-work on the window, in picturesque imitation of landscapes; the mold on the cellar wall, waving to every zephyr; the foliage of hill and dale; — each the antitype of surrounding causes.

See lichens feeding upon rock and incrusting it with their own stony forms; corals building reefs; shell fishes, armadillos, and turtles, covered with huge plates of stone; adapted each to its environments.

See atoms moving in obedience to affinities and repulsions; motes in the sunbeam; the flood of insect life; feathered songsters of the groves; all echoing back their environments.

Behold atoms, fishes, reptiles, — the animal kingdom, — humanity; all with senses measured to their state and place, and crystallizing into types, classes, kingdoms.

Behold this human-mold; in its cobwebs of brick, its temple-decked cities; each atom environed; and the whole crystallizing into classes, religions, governments.

Look again with the telescope into this upper dust of the eternities, the frost-work in the ethereal sky; yon Milky Way, waving a foliage to the music of zephyrs; dots of crystallized light, in fire-fly swarms; each atom

chained to its place by environments, forming crystal constellations; in exact arrangement, crystal with crystal, forming systems, and infinities of systems; and all living and moving according to environments.

Look again, with the microscope, into the infinite and boundless atom; behold here worlds and systems of worlds, life and forms of life; all chained to their place and sphere by environments. Study here, in the rain drop, the possibilities of discovery, when powerful telescopes shall have brought near and made visible remote suns hidden away in the infinite depths; wide enough, our sun between, to separate heaven and hell.

Stay here, and view from afar these infinitely varied pictures; for they are the shadows of God. See everywhere activity and life; all things, within and without, manifesting the consciousness and soul of environments; the Infinite in the finite and the finite in the Infinite; mind within mind, and shades of mind; soul within soul, reflecting soul,— God,

> "Higher than heaven, what canst thou know?
> Deeper than hell, what canst thou do?"

This volume will show, in its rounded whole, that a unity of thought and of soul, of properties and attributes, pervades the whole organic and inorganic kingdoms of matter, of our world, and of all worlds. Existence everywhere is relative;

> "In God, no high, no low, no great, no small;
> He bounds, extends, and equals all."

Suppose an inhabitant of the great star Vega, corresponding to the body on which he resides, to be fifty

miles in height, with body and limbs proportioned accordingly.

Suppose such a being could visit other worlds, and should land, first on some star midway between his own and our earth, and find the inhabitants mere dwarfs, being only one mile in height; would this make them contemptible, if he reflected that such little creatures might still think and reason? And when he learned that these puny beings were short-lived, passing but one fiftieth of the period of his own years between the cradle and the grave, would it not seem to him that this was like dying as soon as one was born? Should he next visit the earth, and by the aid of a microscope discover human-animalcules on its surface, which were so short-lived that they died before he had time to examine them, could he believe that intelligence belonged to such infinitesimal insects?

The above is but an ideal illustration of the relative nature of existence, and how little we can know of the reality of things out of our state and place. The infinitesimal beings hidden away, beyond the power of the microscope, are, perhaps, as vast, from the stand-point of their environments, as we.

Who shall say that even the mighty expanse of the universe, as viewed by God, is not as finite as the rain drop?

Chemistry affirms that atoms of matter possess certain molecular forces, repelling or attracting each other; and that chemically uniting, they assume certain unerring geometric forms and positions in reference to other atoms.

By use of the word "atom," we mean those forms which to human sense appear small.

But geometry cannot distinguish between the circle of the universe, the circle of the earth, or the circle of an atom ; it divides them alike into latitudes and longitudes, degrees, minutes, squares, triangles, prisms, and infinite angles of subdivision ; but it discovers no difference in their sizes. Erring finite sense, however, from the stand-point of its environments, says, here an atom, and there a sun.

The geometric forms of matter are presented to us in countless numbers ; but chemical crystallization discovers certain systems in the primordial shape of which depends the form and arrangement of solids, liquids, or gases.

Salt crystallizes in cubes, nitrate of potash in needles, mica in leaves, liquids in various ovals, gases in nearly globes, electricity in zig-zags, and light in straight lines.

It is probable that all chemical substances differ only in their geometry or plan of structure ; and by an infinitely complex geometry, we have an infinitely complexed chemistry ; therefore an infinitely complexed universe.

Chemistry is therefore the manifestation, to us the materialization, of geometry — the synthesis of God's consciousness, manifest in the material universe ; which, viewed from the divine stand-point, is volatile and fluid — a principle, a law, and not, as we see it, cold objective facts.

Every atom of this universe has a negative and a positive pole, an attractive and a repellant side, a light and a dark, a bass and a tenor ; if you please, a sexuality of sides ; it is this that causes the atom to unite with other atoms, in a prescribed manner, compelling crystallization to assume fixed and definite forms. It is this law which builds up the snow-flake with such unerring exactness ; frost-work on the window ; stalactites, hanging in inde-

scribable variety of richness and beauty — crystalline forests, with every atom arranged in reference to every other atom, and waving its foliage to environments; it is this that builds up the cell of all life, and compels cell to unite with cell, in fixed and unerring laws, producing the moving flood of animal and human life.

How living the instincts of atoms; how intelligent their activities, as each takes its place in a prescribed manner, and acts its part in reference to other atoms!

Every atom in this universe is sexed; yet affinities for unlike atoms are often stronger than for their own. Oil will leave its own companionship to mix with alkali; and carbon leaps, with terrible force, to find its equivalent of oxygen; how like the union of the human sexes, atom selecting atom, and uniting in a fixed and definite manner.

How living the microscopic as well as the telescopic atoms of the universe; each of which has a geometric and exact form, a positive and a negative pole, a repellant and an attractive force, affinities and repulsions, with capacity of choice for other atoms.

How closely allied these living, moving, intelligent activities to the activities of the moving intelligence we call humanity!

We must, therefore, regard atoms as the simple geometric home of consciousness, each a ball or bundle of attributes, impelling them to certain unerring activities; having each, according to its consciousness, a definite form, by which it is enabled to unite with other atoms, in simple or complex groups; or in infinitely heterogeneous, yet exact, arrangements.

The propagation of arrangement, in atoms, depends upon ancestry or seed crystals; and it is as difficult to de-

velop crystals without seed, as to produce life without eggs; therefore the propagation of arrangement in atoms is governed by the same laws as the propagation of living things.

This law of parentage, which governs the propagation of all life, extends down through the whole domain of nature, to the bottom of the crudest chemistry. It is the initial arrangement which determines the arrangement of the whole — the leaven which leavens the loaf — the ancestry of all progeny, high or low.

This is the law by which suns multiply suns in the infinite universe; by which worlds evolve worlds; by which life upon our globe multiplies itself; mineral crystals produce other crystals; even to the formation and growth of iron, copper, lead, gold, and silver; the fundamental chemical differences of which consist alone in the arrangement or geometry of atoms.

Crude chemistry discovers no difference between croton-oil and sweet-oil; but arrangement, through vegetable growth, has produced in them combinations totally dissimilar.

The ascending complexities in crystallization, rising in a scale nearer and nearer to life, are the result of crossings, producing higher and more complex crystals, until they ascend to the threshold of life. By this law of parentage in the arrangement of atoms, we find an explanation of various epidemic diseases. The air, from peculiar causes, becomes pregnant with atoms capable of multiplication in the human system; not high enough to constitute life, but a mere arrangement of atoms below the threshold of life.

Again: the relative proportion of elements, producing a chemical compound, cannot be changed; but there

is no end to the capabilities of crossings or amalgamations of chemical compounds.

The laws which govern crossings in the animal kingdom reign as supreme here in chemistry as elsewhere. Elements of similarity must predominate over the elements of dissimilarity, and the more numerous the crossings, locking into one chemical compound a multiple of chemical elements, the nearer does that substance approach life.

In short, when the number of elements, by chemical crossings, become sufficient, that substance manifests the phenomena of life.

To quote from Huxley: "Oxygen and nitrogen unite in given proportions to form air, oxygen and hydrogen unite in given proportions to form water, oxygen and carbon unite in given proportions to form carbonic acid, nitrogen and hydrogen unite in given proportions to form ammonia. When the compounds named, viz., water, air, ammonia, and carbonic acid, amalgamate and unite into one simple chemical substance, in given proportions, it gives rise to protoplasm, a substance manifesting the phenomena of life."

Protoplasm (a name implying the lowest, simplest forms of life) is therefore simply a complex, glutinous, globular crystal, simply a multiple of atoms, geometrically or chemically arranged into a minute cell or sac, with a central cavity, through which the principles of endosmose and exosmose begin to play, or secretion and excretion, thus manifesting the phenomena of life. Such crystals exist in infinite numbers, as the pure product of nature, and are the primary ova out of which all life has sprung, and the basis of the structure of all life.

It is protoplasm which produces the greasy feel at the bottom of stagnant water, and sometimes floats on the surface ; the mother of vinegar, the white and yolk of the egg, the globules of our life's blood, the base of all cellular structure of both vegetable and animal life, the clay of the potter, out of which all life is molded.

Protoplasm contracts under the influence of electricity, it coagulates by heat, it yields the same response whether free in nature or in living tissue ; these ova are as varied in size, color, form, and character, as the ratio of the combinations of atoms which compose them.

Protoplasm is constantly dying and being resolved into its constituent elements or atoms ; what is food to-day is the living tissue of to-morrow. Even mental processes depend on the death or combustion of protoplasm ; every emotion of the brain feeds on tissue ; every thought of man costs him physical loss. Happily there is a source of supply ; vegetation can subsist upon crude chemical elements, creating, out of it, lower forms of protoplasm ; animal life transforms this vegetable protoplasm into higher forms, preparing it for transubstantiate human protoplasm.

It may be a small thing to admit that the dull vital character of protoplasm is the result of the chemical character of elements which compose it ; or that the dull vital action of fungus is the result of the properties of its protoplasm ; but we can discover no logical stopping-place between this admission and the sequence that all vital action, even to mental phenomena, is the result of the natural forces of its protoplasm, or of the chemical properties of elements which supply it.

CHAPTER XI.

SPONTANEOUS LIFE — NO LIFE WITHOUT ANTECEDENT LIFE — THE FIRST LIVING THINGS THAT INHABITED THIS GLOBE.

"And God said, Let the earth
Bring forth the living creature."

Whence come the swarms of animalcula, developing in water the moment it becomes stagnant, infinite in variety and number; the minute beings that sometimes turn a landscape of snow black in one hour; the parasites which infest other forms of life, and, dying, convert its substance into a moving sea of maggots? It is answered. — From germs of a preceding life. The advocates of spontaneity have also made replies.

We have neither space nor time to enter into the history of that battle which covers twenty centuries, in which great minds have been arrayed for or against spontaneous life; and the unlimited microscopic experiments of chemists, in which the victory on the part of the advocates of spontaneous life has been gained, and as repeatedly lost.

If we were not seeking for the truth, whatever the consequences; if we were pleading the part of a lawyer, resorting to any means of substantiating a case, we could produce an array of statements from high authorities, resulting from experiments, that would carry conviction as to the every-day development of spontaneous life.

For it is a known fact that water left free to the influence of sun and air, soon swarms with living beings; that an infusion of hay will become milky, within twenty-four hours, by the development of bacteria; and it is of every-day experience, that it is difficult to prevent food from covering itself with mold; that meat is apt to putrify and fill with maggots; that differing solutions ferment and fill, like vinegar, with different types of living things.

The opponents, however, of spontaneous life, have affirmed that this whole array of beings is the result of hatching of eggs thrown out by a former life, floating as germs in the air or water.

In support of this position, they have shown that when substances have been heated sufficient to destroy germs, and hermetically confined in flasks, like ordinary canned meats and fruits, where the inclosed air has also been heated; or even when the flasks are left open, and the opening connected with the air, by a tube turned downward, so as to furnish no *receptaculum* for falling germs; or even when these heated flasks have been left wide open and covered with layers of cotton-wool, no animalcula, infusoria, or living thing made its appearance; and here the advocates of spontaneity seemed for a time defeated, but they soon found a new battle-ground.

Driven from fluids, heated and hermetically sealed, they took refuge in the air! Whence come these germs which produce various types of life, according to the varied solutions into which they fell, and in which they developed?

The opponents of spontaneous life became amazed at the paradox of their position; they had carried the battle-ground to the air and filled it with ova, capable of an

endless variety of development, according to the substances into which they fell.

And here stands the combat; the advocates of spontaneous life facing the apparent absurdity that the atmosphere, which they had regarded as a pure oxygenous compound, is everywhere swarming with ova,—protoplasm,—or the germs of living things. But Tyndall has proven this absurdity to be nevertheless a reality; he has demonstrated that the air we breathe is no better than a moving sea of extremely minute solid particles. These particles are destroyed by heat; they are strained off by cotton-wool; they require air and sunlight, the necessary conditions of all life for unfolding; also contact with and nourishment from other substances for vitalization and development.

Therefore while the ova of the beings that develop in liquids exist in their native state in the air, much of the microscopic life which fills the air is evolved from ova, or protoplasms of water; as illustrated in the evolution and development of the common mosquitoes, seen first as wigglers, swimming in water.

Thus new conditions, with new environments, cause new developments in all the departments of life; and this is true, even to the highest; they as well as the lowest, are transformed by surrounding conditions.

Thus it is, in the end, the evidences from microscopic and chemical experiments lock hands with logic; and every mote in the sunbeam, as well as nucleated centers of water, become particles of life-tissue, ready for absorption, by roots and leaves of vegetation; ready for transformation into the globules of our life's blood, the tissue of our bodies, and the food supply of our brains; or ready to assume an independent life when transplanted

into favorable surroundings; becoming the malaria of disease, the germs of contagion, the animalcula of fermentation, the mold of decay, and the maggot of corruption.

It is not necessary to array the experiments of Dr. Clark, who in his "Microscopic World" declares that various chemical substances produce various given types of animalcula and infusoria. Nor is it necessary to reiterate arguments of past ages, which have had, at all times, advocates of spontaneous life; even St. Paul declaring in pointed language,

> "Thou fool; that which thou sowest
> Is not quickened unless it die."

Have we proven spontaneous life? have we demonstrated that the elements produce it? that it enters through the door of that highway over whose portals has been written —

> "*Omne vivum ex vivo*"?
> (No life without antecedent life.)

that it springs, by the amalgamation of elements, from the protoplasm or living forces of nature? that the elements, by an ascending series of amalgamation, produce it, and afterwards modify it?

Such was the dawn of life on this globe; cycles of ages ago, when the cooling of granite rock made possible the paleozoic seas, life came; spontaneous then, as now; and filled air and water with multitudinous, minute moving forms.

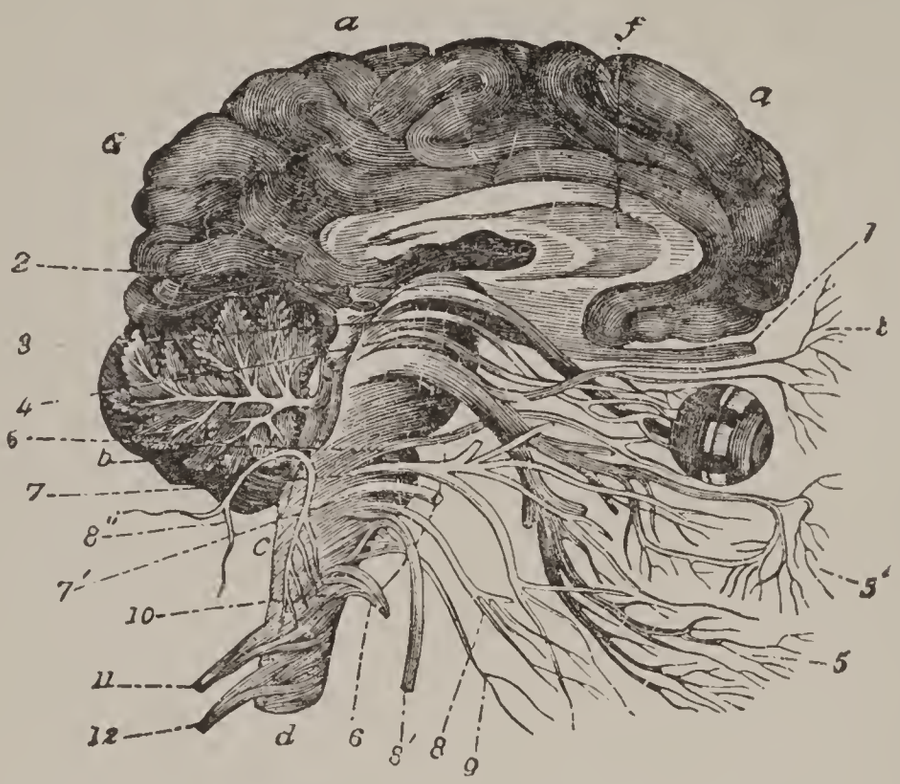
When we look back through the dim vista of mighty ages to the very dawn of life on our globe; when the air extended upward thousands of miles, and was thick with mineral and damp with moisture; when the earth was

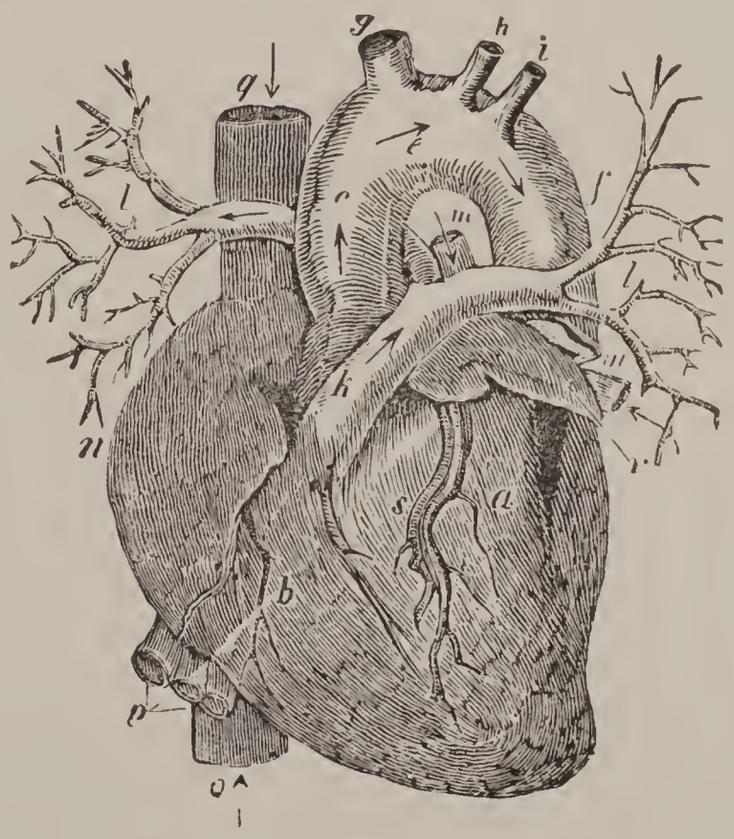
undergoing changes which can no more be enacted again than we can go back into our infancy, we find conditions more favorable for the development of spontaneous germs. Life came in a pure stream,

"Proceeding out of the throne of God,"

the sequence of a mingling of his eternal elements. Long ages filed in stately columns to their tomb, constituting the morning shadows of a day; and his elements crossed and recrossed, amalgamated and re-amalgamated, evolving multitudinous types of spontaneous life.

Grant that I have proven spontaneous life — that the early ages of our earth contained living germs, however closely allied to the activities of chemical atoms; grant me the lowest possible germs of life; and I will clothe our world with verdure; fill the oceans and cover the plains with moving, sentient beings, and show you as the sequence of causation this map of human history.





THE MECHANICS OF LIFE: THE EYE, THE EAR, THE HEART, THE BRAIN.

CHAPTER XII.

THE MECHANICS OF LIFE — THE EYE, THE EAR, THE HEART, THE BRAIN.

"In the image of God created he him."

Life is a union of a number of nature's forces, and rises in the scale in the exact ratio of complexity. A living being is a combination of the living principles of matter — a union of the forces of nature; and rises to the image of God when thought and reason become the *receptaculum* of his thought; when it takes in the eternal principles of justice, mercy, sympathy, and love.

Let us compare mental and vital physiology with natural philosophy.

It has been said that "life is activity, is change, is motion;" and have we not shown that every atom of the universe is activity, is change, is motion?

It has been said that "life is a series of evolutions, from its inception to its dissolution;" and have we not found this to be true of atoms, worlds, and the universal law of things?

It has been said that "life is sexed, male and female;" and have we not shown that every atom of our universe is sexed, possessing an attractive and a repellant pole, without which crystallization could not occur?

It has been said that "life multiplies and perpetuates itself;" and have we not found that crystals evolve other crystals, suns other suns; and this to be a universal law of things?

It has been said that "life has the faculty of choice, loves and hates;" and does not all matter possess adhesions and repulsions; choosing associate atoms; repeling in the convulsions of nature, or grasping in friendship elements of affinity?

But, argues the skeptic, "Animals have instincts which they obey;" and is this not true of atoms, or worlds, moving in their fixed orbits?

"But man has reason, as shown in the accomplishments of design;" and is there not everywhere evidences of design in nature; as creation has struggled upward through long ages, evolving worlds and systems of worlds, life and forms of life?

"Yes; but man has risen above nature, in the consciousness of his *ego*, in the acquirement of an immortal soul;" and have we not shown that the elements are eternal, existing as the simple manifestation of God's consciousness?

Wherein do organic and inorganic principles differ?

Gravitation acts on living as on dead matter; on the blood in our veins, as on a river; fire and heat produce the same effects on organized as on unorganized tissues.

Mastication is a process of mechanical grinding; and does not differ from the methods by which nature ground the geologic rock, and prepared the way for geologic life.

Absorption is the same as capillary attraction; the same phenomenon is manifest in sponge or dry earth as in living tissue.

Assimilation is but another name for chemical affinities and adhesion; in the same manner as chemical atoms choose associate atoms, living tissue chooses associate tissue.

Secretion and *excretion* are identical with the chemical processes of endosmose and exosmose.

Nerve fluid is identical with electricity. It is developed by this whole chemical and frictional human battery, in which all the nerves ramify to and from the brain, like so many telegraphic wires, where is stationed the great negative and positive poles, in the *medulla oblongata*. *Muscular fiber* contracts under the influence of an electric shock from a galvanic battery, the same as when the muscle is charged with a nervous current from the brain, in obedience to the will, by which means we move our arms. The muscle of a frog's leg, when charged with electricity, contracts in the same manner.

Involuntary electric currents pulsate from the brain to the heart, causing its contraction, and the consequent circulation of the blood. All the movements of the respiratory, alimentary, and other parts, depend on electric pulsations ; the very rhythm of the breathing depends on the mechanical perfection of a certain region of the *medulla oblongata*, as much as a watch depends upon the integrity of the escapement.

The principles of the lever, the pulley, the wedge, the spring, electrics, hydraulics, hydrostatics, and calorics,— all play a part in the mechanism of the human economy.

The eye, with its attendant nerve and brain fiber, is a sort of photographer's studio, with varied apparatus for catching and holding lights and shades, and the surrounding pictures of the external world ; here our lives are stored away in miniature ; and the panorama of our histories preserved on invisible and immaterial plates. We look at them afresh in our dreams ; reprint them in mem-

ory ; draw on them for our comparative, poetic, and imaginative themes ; changing and building new combinations. Perchance these plates are stored away in God's eternity for man's immortality.

The ear, with its nerve and brain fiber, reaches back to a mysterious point in the brain. This unknown, invisible, and immaterial point, with its attendant drum and "curling horn," is a sort of telephone and phonograph, wherein is caught and held every wave of sound ; all the voices of nature are here locked for future reproduction ; in close response the organ of voice combines the mechanism of instrumental music ; and the varied sounds of nature, locked in the brain, are here reproduced in human language, human poetry, and divine human music.

Man is a sort of crystallization from the elements which surround him. He has derived his frame-work and chemical composition from atoms out of the external world, in obedience to the same laws which construct the snow-flake or round the rain drop.

Man is a sort of vegetation ; he has derived his life, his nature, his character, from the soil, climate, and natural influences around him ; he has grown like a tree, stunned or ennobled,— the representation of sunshine and shadow, every branch and leaf drawn to its place, every root influenced, bent with the winds, made beautiful or crushed, by the elements ; the product of environments,— the result of circumstances,— the antitype of surrounding nature.

Man is a sort of machine, the great machine of nature, wherein, and upon which, all the elements play a part in propelling the wheels, pulleys, and mechanism of this wonderful economy — a wonderfully intricate machine, the product of nature, and played upon by all the

forces of nature through the medium of the eye, the ear, and the nerves of sensation.

Here, in the human eye, the surrounding panorama of nature finds herself mirrored — gazes upon herself — looks into her own face.

Here, in the human ear and human voice, nature's own pulsations are re-echoed ; — she listens to the vibrations of her own sounds, — hears the echo of her own music.

Here, in the human brain, the hills and stars, beauty and activity, the eternal thought of God, is repeated ; the Infinite reflects the finite, and the finite repeats the Infinite ; here, in the human brain, man becomes a great being, as high and deep, as wide and full, as pure and as vile, as the sweep of his thoughts.

We have seen that man is the antitype of the universe — of nature. He rests on the bosom, after His image, and in the likeness of God.

CHAPTER XIII.

INTRODUCTION TO GEOLOGY.

"Speak to the earth, and it shall teach thee."

The earth is a mighty book, containing a history of itself, every stratum of which is a chapter, every layer of rock an emblazoned page.

The whole detailed history of our world is written in this book. Every time a Vesuvius has opened its crater and belched out fire and lava; every time a Nile has broken from its bed and cut a new channel through a continent; every time a glacier has torn down a mountain; wherever winds have played upon the sands, rain drops beaten, or waves washed; wherever the worm has burrowed its home, and left its remains; wherever life has lived and died; wherever foot-prints have been made, — a record has been kept in rock, with fossils, preserved in sheets of stone, hardening from sand and clay.

Every coral reef that built up continents in the early seas; every type of fishes that came afterwards, and the reptiles which followed them; every race of mammals that roamed the forests of cycles of ages ago; every species of ape or man-like gorilla that inhabited the prehistoric earth; every type of cave-dwelling, fur-covered men, with the marrow-sucked bones they left behind; every race which had learned the use of fire; every tribe which made pottery and stone implements; the people

who came after them, and worked the soft metals; the races who built mounds and pyramids; up to the advent of human history, have all left a story in their skulls and skeletons, their foot-prints and implements, their pottery and religious symbols, their ruined villages and monuments, to tell us the story of their slow and tedious advancement.

Let us illustrate this world-book of geology, by supposing a million years to have elapsed from the present time. The earth will then have presented a new aspect; oceans will have encroached upon continents, and new continents emerged from the sea; yet, after all the unavoidable changes, can it be supposed that the record of this age will have fallen into oblivion? Would not these now mighty and flourishing cities, then moldering in ruin and broken down in decay, like Thebes, Carthage, Troy, the monuments of Egypt, or the pyramids of South America, speak for themselves, and inform the world of their past glory and grandeur? Would not these iron rails spanning continents and broken locomotives buried on the plains; these electric wires, netting up the globe, and their corroded batteries fished up out of the sea, inform future generations that the inhabitants of the nineteenth century knew how to make steam bear their burdens and the lightning convey their messages around the world?

But the most positive evidence that this was an age of enlightenment would be gleaned from the contour of the skulls and skeletons,—the massive foreheads and dignified bearing of the beings who reared these temples of science and halls of art, and decorated them with their presence, then petrified in ten thousand graves. What a contrast would be presented when compared with the

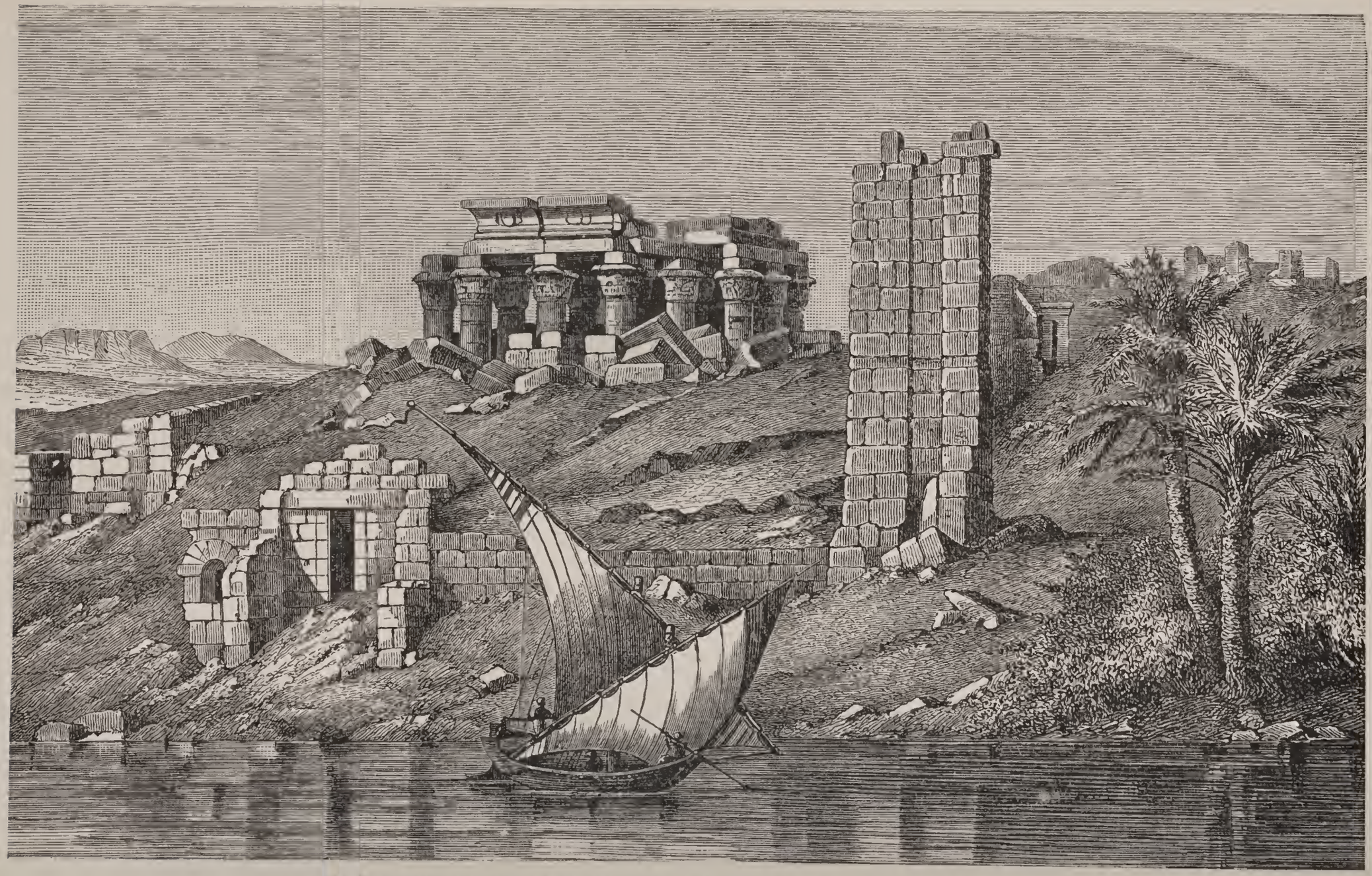
narrow, slanting foreheads of the mound-builders, or the yet more savage aspect of earlier races!

Such a history we have of the past. The work of ages may have fallen into ruins, but ruins remain,—

"They speak to the present and times to come."

Ages have come and gone, and cycles of ages changed and re-changed the whole aspect of our world, but ruins remain; the whole history is preserved intact; bound with ribs of stone; saved amid destruction; unhurt by the play of elements, whirling winds, wearing waters, or consuming fires.

Let us open this great world-book of geology, and taking up layer after layer of the earth's strata, read the record therein contained of the past history of the earth, of the origin of the species and of man.



RUINS ON AN ISLAND IN THE PACIFIC OCEAN. (See Page 317.)

CHAPTER XIV.

FIRST DAY[1] OF THE WORLD'S HISTORY — AGE OF FIRE AND FALLING GRANITE — DESCRIPTION WHICH APPLIES TO THE PRESENT ON THE PLANET NEPTUNE.

"He thundereth marvelously in the heavens,
And the heights gave his voice hailstones,
And coals of fire. He commanded the sun
Not to shine, by the clouds which went between.
At the brightness which was before him,
His thick clouds passed hailstones and clouds of fire."

There was a time, far back in the eternities, when in this place of a solid earth, there existed a stupendous nebula of hot and fiery gases; hills and rocks were chaotic, phosphorescent clouds; and the ocean wrapped around all, millions of miles of vapory tresses; cooling and precipitating flakes of granite, which fell in steady showers from the vapory circumference towards the center. The more intense heat towards the center of the

[1] The word "day" is of course considered not as a literal day, but as symbolical of a long period of time — ages, during which God was fitting this earth as a home for man. The idea of exact days of twenty-four hours each is neither required by the original nor by the scope of the narration. The Christian fathers did not interpret it as a common day. Augustine, in the fourth century, called the days of creation "ineffable days," and described them as "alternate births and pauses in the work of the Almighty — the boundaries of periods in the vast evolution of the worlds." How glorious the idea which we here obtain of God, as, through measureless ages in which he is rich, resting not, hasting not, but slowly and by the steady operation

igneous vapory world again melted and sent back, by the law of expansion, to a point of balance, where now stands the granite, resting on ethereal fire.

The process of cooling, which in the beginning hardened the liquid surface of the granite sea, like ice on the surface of water, is still as active as ever, and granite, even now, may be in process of formation in the underlying deep strata of the globe, thereby thickening the earth's crust by a process of steady cooling and hardening against the ebullitions of the underlying molten sea.

The internal substances of the earth become expanded and vaporized by the increasing intensity of heat as we go downward, and the earth's center is, perhaps, a hollow globe of tremendously heated gas; since the ratio of increasing heat, observed with the ratio of depth in mines and deep artesian wells, would not only fuse the metals at the depth of fifty miles, but more centrally convert them into gas; herein is explained the deep-seated cause of earthquakes and volcanoes.

In addition to the expansive properties of heat tending to make the earth nearly a hollow globe, she has a rapid axial rotation, and its Herculean centrifugal force holds outward to the plane of the earth's surface internal substance; this cause alone will make a rapidly rotating

of his own laws, he works out to the finest detail his mighty thought of the world. Moses gives but the grand outline of this creative act, an outline which geology is filling up rapidly and surely. The Mosaic account is a hymn, full of poetry and grandeur, not a close, exact, scientific record of events. Yet its truths were inspired by the same God who made the world. As such we receive the records of both revelation and nature, and gladly notice their harmony in all their grand teachings. As yet geology is in its infancy, and we are often able only to suggest and intimate what may hereafter be, firmly believing that God's truth must stand, whether it be revealed in the rock or in the book.—*Steele.*

body a hollow globe, the internal dimensions of which will be proportioned to the rapidity of axial rotation.

The first proper geologic day was the age in which the cooling gases of a chaotic earth precipitated its atmospheric rock, like falling meteors or hail, and built up the deep miles of granite which form the foundation of the earth's crust, resting on a molten flood.

> "For He founded the earth upon seas,
> And stretched it upon floods."

The great center of the earth yet remains a gaseous and igneous ocean. The earth is one stupendous caldron of fire incrusted with a thin shell; volcanoes are passage-ways or vents to the deep-seated fiery sea.

The volume of lava expelled in a single night from a bursting volcano, often exceeds the bulk of the entire mountain.

Volcanic mountains are stretched in lines or long chains on the sites of old fissures — seams in the crust of this globe reaching down to central fire.

The Rocky Mountain chain extends from pole to pole; in the north lifting ice heads from white crystal seas; magnificent peaks, locked hand in hand, stretch away in lines of beauty spanning the western shore of the two American continents, with extinct or active volcanic craters to the mighty fires that still illume the South Antarctic seas; here is a great fissure, a break, in the crust of this globe, extending down to its heart's core, where the hot pulse of the world's passion is still felt in giant throbs.

The four great Mexican volcanoes, Jorullo, Colima, Orizaba, and Popocatepetl, are on the same fissure line. Jorullo, when it broke forth in 1759, came directly in line

with the other three. On the same night that Orizaba was in action, three thousand miles to the south, on the same fissure, Aconcagua was belching forth its fires; while Etna and Vesuvius on the Alpine fissure burst forth, accompanied by an earthquake, felt over an area of more than two thousand miles.

Such phenomena prove the cause of volcanic action to be deep seated.[1] An earthquake felt at Sydney traversed the Atlantic, and was perceptible on all the great lakes of America, covering an area one eighth of the entire globe; phenomena of such magnitude point to mighty and magnificent causes.

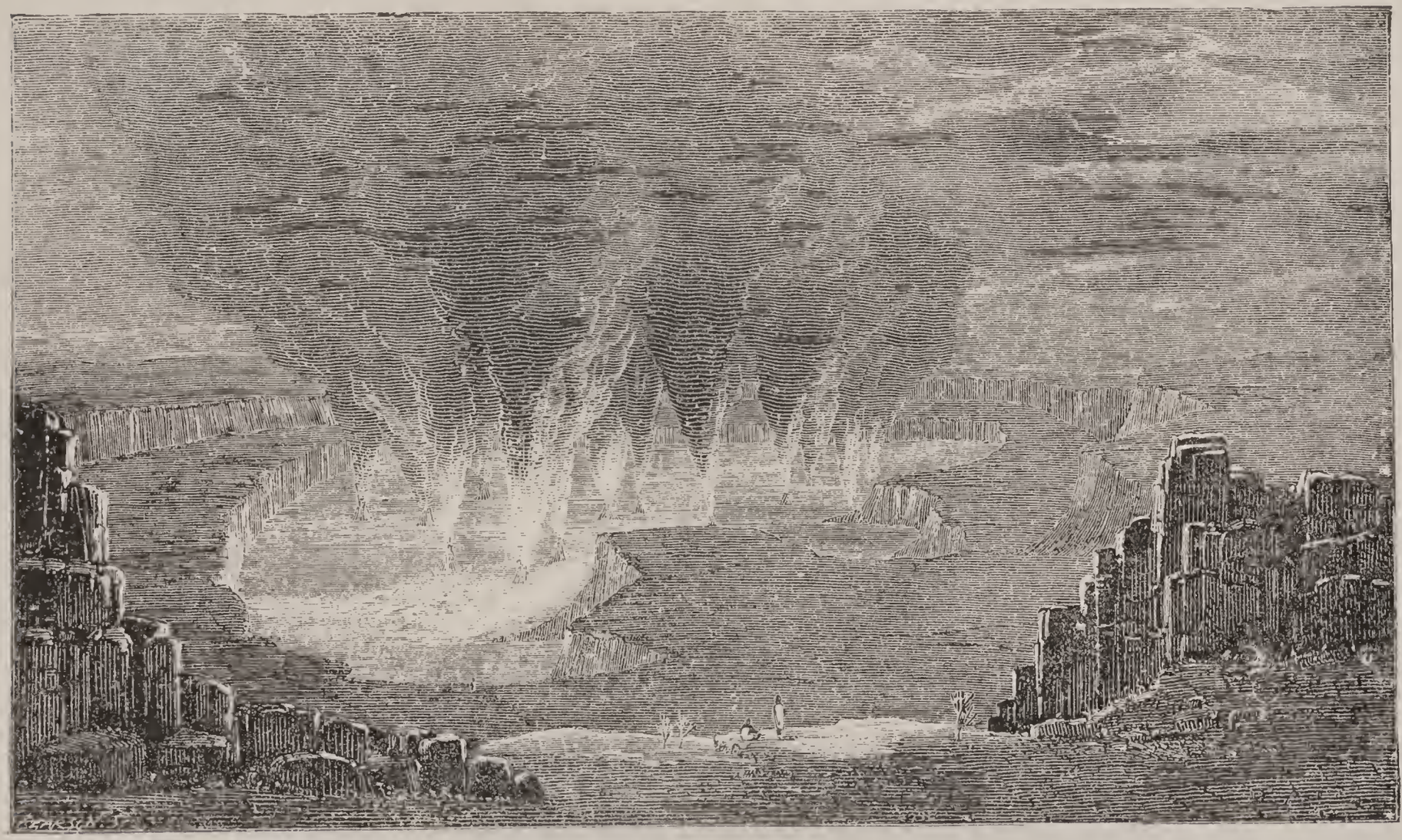
We stand on a thin crust, sustained by a fiery flood,—a thin and yielding crust, which bends in lightning waves with earthquake shocks, sinks and swells in sympathy with the stars, pulsating like a mighty human heart, under the energy of which come volcanoes and earthquakes. Lo, all beneath is fire — a bubbling, hissing hell, caged and chained with the thin crust upon which we tread![2]

Reader, go back with me again into the first dawning day of the world's history; imagine the fiery conflicting

[1] On the morning of May 9, 1876, the earth's crust at Peru gave a few great throbs upward. The sea fled and returned in great waves as the land rose and fell, and in less than five hours giant waves had covered a space equal to South America; they ran out to the Sandwich Islands, six thousand miles distant, at the rate of five hundred miles an hour.

[2] Mount Yzalco, in the little republic of San Salvadore, arose suddenly from the plain in the spring of 1770 in the midst of what had been, for nearly one hundred years, the profitable estate of Senor Don Erazo.

In December, 1769, the peons were alarmed by terrific rumblings, constant tremblings of the earth, and frequent earthquakes, and on February 23, 1770, the grand upheaval took place. First there was a series of terrible explosions, which lifted the crust of the earth several hundred feet, and out of the cracks issued flames and lava, and immense volumes of smoke. Rocks weighing thousands of tons were hurled into the air, and fell several



Open Molten Crater in the Sandwich Islands. "We Stand On a Thin Crust Sustained By a Fiery Flood."

scenes of the early time; let us add fuel to the earth's present fires, pour combustibles of terrific force into its very center, convert the oceans into naptha, the rocks into giant-powder, and sink mountains of nitro-glycerine deep into the fiery bowels of this earth. Then get thee back to some safe place in God's immensity, pray to him for succor amid the sylvan shades of some far-away planet, be satisfied with standing-room on the scaffolding of Saturn's outer ring, and there, wrapped in solitude, wait patiently the slow evolving process of God's infinite plan; behold the earth as she once was, a blazing, burning, fiery nebula, streaked with shades of purple and crimson, garnished with silver and covered with cloth of gold. Be patient in thy solitude; for a million slow rolling ages must elapse before e'en a crust of red-hot liquid granite shall have formed for thee an embryotic core of the future earth.

Be patient in thy solitude, for thou art back in the eternities, amid the magnificence of God's temple; lose thyself in the awful grandeur and magnitude of his handiwork.

Behold in the place of the earth a fiery mass surrounded with vapors, one hundred and eighty thousand miles in diameter, rotating majestically on its axis even

leagues distant. The surface of the earth was elevated about three thousand feet.

These discharges continued, accompanied by loud explosions and earthquakes, which did much damage throughout the entire republic. In less than two months, from a level field rose a mountain more than four thousand feet high, and the constant discharges from the crater have accumulated around its edges until its elevation has increased two thousand feet more. The cone of lava and ashes is now two thousand five hundred feet from the foundation of the earth upon which it rests, and is constantly growing by the incessant discharge of volcanic matter.

more rapidly then than now; behold the external vapors caught up by centrifugal force, and in great folds held outward twenty thousand miles, forming stupendous external rings; behold them, as the central mass cools, breaking into detached parts, and falling in a mighty display of varied colored lights, in meteoric storms upon the earth; or uniting with the earth's companion comet in a solid body, as it slowly yields up its moisture to the sun, and leaves only the cold, barren rock of a desolate moon, entombing the record of its ancient glory in feeble, reflected light.

Behold centrifugal force in the depths of the revolving, fiery world, struggling with gravitation, and anon becoming its master; while from the center the molten fire plunges outward, instead of inward, forming the stupendous hollow deeps of Milton's resounding hell.

Mark the change wrought in the first day and subsequent periods of the earth's history; the sublimity and magnitude of which mortals sometimes see in the immeasurable distance, when anon, a comet with blazing front and retort of surging, boiling elements, dragging behind a train of fire and débris two hundred thousand miles in length, stations itself, like a "flaming sword," in the northern sky: or, anon, when we look through the telescope at the planet Neptune, whose condensing vapors have draped the silver and gold, and robed a central blazing sea of fire, whose central heart holds outward red waves of rolling, molten rock; wrapped in smoke and vapors,—in a painted shield of black and grey,—in cloud-belt blankets thirty thousand miles in depth.

A million colored lights dance in the wide expanse of the world abyss, shaded with fogs and drapery of vapors,

reflecting shields of silver and castles of gold beneath a black ebony sky of surrounding vapors.

See meteoric storms, with showers of crystal granite falling like an infinity of fire-flies from the black background of the illuminated heavens. See mighty tides, tornadoes, and revolving columns plunging onward in the atmosphere of fire, while the heights pour down hail from the astonished sky; behold heaven on fire, pouring out ashes to form a boiling sea of surging, wave-dashed rock; behold the heaving bosom of that liquid sea as the trembling shoulder of underlying heat yields to the unequal weight, and floods of molten rock plunge into the hotter depths of hell; where fused into vapors, it rises again, in loud bellowing bubbles, on the surface of the boiling pot.

The first day of the earth's history rolled into eternity, and the ending saw a molten flood of granite, heaving its breast in stately tides, and dashing red waves with white, hardening billows, o'er all the landscape; while high above, a mask of dark clouds with silver linings filled the firmament, enveloping the world in a painted fold; shutting out the stars, and holding its mighty mantle against the sun.

Reader, look again at the planet Neptune; and you behold a bulky planet, composed mainly of dark carbon clouds, and fog-banks of moisture, enveloping a central molten core in gossamer folds thirty thousand miles in depth. She is now in the first day and age of her history; repeating the history of the first day and age of the world. God covered the light with darkness, dividing from it the light of the sun.

"And the evening and the morning were the first day."

CHAPTER XV.

SECOND DAY OF THE WORLD'S HISTORY — AGE OF FALLING OCEANS — FORMATION OF GNEISS — DESCRIPTION APPLICABLE TO THE PRESENT STATE OF THE PLANET URANUS.

"And God said, Let there be a firmament
In the midst of the waters, and
Let it divide the waters from the waters."

The process of continued cooling and condensation went on through infinite ages; and the watery vapors of a high upper firmament were slowly yet surely "bowing the heavens and coming down," and gathering in gossamer clouds on the face of the liquid sea of granite; its surface hardened into rock, like the formation of ice on the surface of water; and clouds began to precipitate moisture, and pour down flooding waters.

"Channels of water were seen, and
The foundations of the earth discovered."

Then commenced a series of actions and reactions, which for terrific grandeur and awful sublimity, were never equaled at any prior or subsequent period of the world's history. Hydrogen found its equivalent of oxygen, and vapors wrapped the world in a majestic fold; while steadily increasing torrents fell from the black sky.

Water, falling from the atmosphere, ran down into crevices of the rocks, and coming in contact with intense heat, became again converted into steam, breaking the

rocks into fragments, and scattering débris in all directions, while the atmosphere gave back its waters in one continued shower.

Around the jagged heads of recently upheaved rock, clouds gathered and poured their floods down the ragged sides; and sediment thus formed was spread over the floor of boiling seas.

The metals were suspended in the watery solution; and under the play of electric currents, they acted and reacted on each other, until mineral beds and crystalline veins were formed.

Nature was at work in the great crucible, as if by design preparing for the needs of future ages; seams of gold and veins of silver were hid away in the rocks; while the débris of crumbling, wave-washed granite, charged with new chemical substances, hardened into gneiss and slate.

At this period, the earth presented a scene awful in sublimity. It was the war of confusion and chaos; land and sea, water and fire, were strangely intermingled; and masses of rock, red with heat, shot up from infernal depths. The breaking billows and wild, watery landscape, contrasted with the lurid glare of fire, flashing forth phosphorescent flames from wide-mouthed volcanic craters, illuminating the heavens like northern lights, or hanging like mighty comets far off with their fiery heads in the sea.

The artillery of earth and sky volleyed forth majestic tones; the heavy gutteral rumbling of earthquakes, mingled with the lightning's shrill cry, while water struggling in the arms of fire sent forth moans and groans; and a pandemonium of conflicting voices echoed up from the depths of hell. All creation was at war in these her morning ages.

But the plan of to-day in all its serene and wonderful detail, was written in the early turmoil; the chaos and commotions were the throes and spasms of a majestic birth, the birth of every possibility since enacted in the history of the world.

Nor was the struggle, the turmoil, the battle, of short duration; for ages the conflicting elements of fire and water labored onward in throes of volcanic fury, heaving, distorting, and breaking into fragments the thickening crust, while earthquakes and volcanoes belched out fire and rock from innumerable vents and openings.

> "He shot up his arrows, and scattered them;
> He sent his lightnings unto the ends of the earth."

Gneiss overlies the granite, and differs from it only in being stratified. Indeed, it is often difficult to distinguish the two kinds of rock, so insensibly do they pass into each other. Gneiss is therefore the product of granite, crumbled by the action of hot water, like slacking lime amid boiling seas. The slates were a still later primitive formation, made up of the débris of granite and gneiss, charged with carbon and new and various chemical substances. The early oceans were seething caldrons of boiling water, since gneiss and slate are the products of an incomplete metamorphic action by heat.[1]

[1] In the account given of the Pluton geysers, California, we seem to have an insight into the laboratory of the world, and can learn something of the chemical changes which have been going on in past ages. These geysers are hot springs, which throw out intermittingly and spasmodically powerful jets of steam and scalding water. The water contains sulphuric acid, sulphureted hydrogen, and probably other active solvents. The rocks are rapidly dissolving under this powerful metamorphic action. Porphyry and jasper are transformed into a kind of potter's clay. Trap and magnesian rocks are consumed much like wood in a slow fire, forming sulphate of magnesia and

Gigantic geysers sent up volumes of boiling water and dark clouds,

"With heaven's artillery fraught,
Rolled on o'er the Caspian,"

while wheeling cyclones caught up old ocean's watery tresses, and moved in stately water-spout columns on the flood, and chained the waters which were under the firmament to the waters which were above the firmament.

The second day was the long ages of the struggle between fire and water, in which water at last triumphed; and old ocean dashed her tidal waves against barren mountains of crumbling granite.

Reader, look through the telescope at the planet Uranus, now in the second day and age of planets, and you behold the earth as she was in the age of forming moisture and falling oceans.

"God made the firmament, and divided
The waters which were under the firmament
From the waters which were above the firmament.
And the evening and the morning were the second day."

other products. Granite is rendered so soft that one can crush it between his fingers as easily as unbaked bread. The feldspar is converted partly into alum. The boulders and angular fragments brought down the ravine by floods are being converted into a firm conglomerate, so that it is difficult to dislodge even a small pebble, the pebble itself sometimes breaking before the cement will yield.

CHAPTER XVI.

THIRD DAY OF THE WORLD'S HISTORY — AGE OF DAWNING LIFE — CREATION OF MARBLE — SCENES NOW BEING REPEATED ON THE PLANET SATURN.

"THE earth brought forth grass, the herb yielding
Seed, and the fruit-tree yielding fruit."

The conflicting elements of water and heat labored onward in mighty throes and convulsions, thickening the earth's crust at every rent and seam, in every distortion and upheaval; and barren wastes of rock lifted their cloud-capped heads high into the sky, while continents heaved their breasts amid the billows, and slowly prescribed the limit of receding tides.

"God said, Let the waters under the heavens
Be gathered together unto one place,
And let dry land appear; and God
Called the dry land earth, and the
Gathering together of waters, called he seas."

Gneiss is generally buried beneath vast accumulations of marble and other later formations, by heat and the influx of hot water, charged with various chemical substances, and crystallized into various substratified rock; and the evidence of the simple germs of life which first inhabited the globe obliterated.

Marble, however, is found in every stage of metamorphosis, from the lower, complete crystalline, the mid-

dle, partially fossilized, and the upper limestone, composed exclusively of the remains of a former life.

In the record of this third day, we read that God commanded the elements to produce life. His addresses were directed to earth, air, and water: —

> "Let the earth," "Let the air," "Let the water,"
> "Bring forth the living creature;"

and it came, — the spontaneous product of the elements, beaming like motes in the rays of light, the simple union of chemical atoms; in the warm, damp, and mineral-charged atmosphere, where chemical activities were mingling; and showers of infusoria fell into the sea, and were metamorphosed by it; clouds of animalcula and shoals of insectivora, struggled upward, through crossings and amalgamations, from simple chemical atoms to visible, active germs of living things, and left the dèbris of their dead forms, food for devouring elements.

Ages passed by, and life went on multiplying, changing, crossing, climbing upward to higher forms, until it left fossil evidences of its existence imbedded in rock, — a hieroglyphic story on tables of stone of the earth's mighty past.

The first evidence of fossil life, and therefore the earliest geologic record of the simple living things which inhabited the globe, is probably contained in serpentine marble.

Before me is such a piece of rock, once the soft substance of a sea-beach, studded with the charred and partially destroyed forms of the simple germs that swarmed the waters of the early seas, and left their remains stranded here by receding tides.

If the limestone layers of this piece of stone be removed by an acid, the granules in the residue resemble the casts of rhizopods; the relics of the beings that as far as geologic evidence can go, were the first living things to inhabit this globe.

The evidences of marble, however, step by step upward in the order of the formation of its layers, become at last conclusive and clear, filling the crevices with beautifully colored figures, as seen in variegated marbles; higher still we discover perfect outlines of shells in extensive beds, since converted into solid marble; and slabs of varied colored marble admitting of the highest polish, and showing the clear outlines of the million skeletons of the living beings, the débris of whose dead forms compose it, may be seen almost everywhere as decorations for furniture, and ornamentation in sculptured stone buildings.

The third day was long beyond description, in which vast beds of marble and other limestone were formed, of wide extent and thickness; by the wear and wash of waves, by the growth, death, and decay of living things.

The thin crust of the globe palpitated in mighty throes and convulsions, and the protoplasm of life mixed its dead substance through all the wave-washed débris of marble rock. Lime forms a prominent constituent of shells, bones, corals, etc. Animals secrete lime from the water in which they live, or from the food they eat; when they die, their mineral remains accumulate in great quantities, and gradually harden into rock. Chalk was formed by the consolidation of minute shells smaller than a grain of sand. As each particle is cellular, and not solid, chalk has a soft, porous structure, and the microscope reveals the tiny shells. Even marble and other limestone, con-

taining no trace of fossils, was made by the sea breaking and grinding shells and corals into powder, just as it grinds rock and pebbles into sand. We see this process now going on in the formation of coral reefs. From the vast extent of limestone on the earth, we form an estimate of the amount of animal life which existed in past ages.

Marble is crystallized limestone, and is one of the rocks in which metamorphic action by heat can easily be traced. When not thus modified, we find it as common limestone, chalk, etc. By heat it takes on a crystalline structure, its color is changed, the fossils are generally destroyed, and the various impurities form new minerals which often fill the veins of the marble with beautiful colored figures, as seen in variegated marbles.

The evening of the third day rolled into eternity, and a morning came, called by geologists the Salurian era, in which sandstone, shale, and various limestones were formed; the product of crumbling wave-washed rock, mixed with the dead débris of fossil shells, and low forms of vegetation.

No highly organized animal life yet existed; there were no wild cry of birds, no dashing of monsters in the ocean foam, no terrible beasts of prey waking the echoes with hoarse roar, no landscape forests of maple and pine on the crests of ragged mountains.

Earthquakes still rocked the yielding crust of the globe to and fro, and from fissures belched out floods of lava, forcing before it the mighty sea, whose waters leaped, in thundering explosions, into hissing vapors; and volcanoes belched out fire and rock in wild disorder.

The sun struggled in vain to penetrate the dense atmosphere of a yet heated, primitive world: the air, damp with fogs and foul with gases, stalked o'er land

and sea: a "leaden pall" hung its dark garment in the heavens: there was no rainbow of radiant colors, reflecting the soft shadings of sunlight: there was no ethereal blue of mid-day; no starry canopy, with lesser and greater lights; no evenings decked with the Milky Way of shining stars.

Mosses, grasses, and "herb yielding seed;" in short, the coral life of the sea nowhere rises above the vegetative plan of life; and we shall show in a future chapter, on "Embryology," that all types of life begin existence as vegetation by the simple union of cells.[1]

Graptolites covered the muddy bottom of the sea with their quaint, mossy forms, waving their branches and scattering offspring in the flowing tide. Coral reefs stretch away, in lines of beauty, where "myriad workers toil to build up their fragile, many-colored homes."

Every wave strews the sands with shells and broken corals. Trilobites skull their tiny boats, and with shoals artholites are buried in rolling sands.

Mollusks luxuriate in endless profusion, and leave the débris of their shells, mixed with the ground clay of their dead companions, in reefs of chalk, clay, limestone, shale, and sandstone; which, though hundreds of feet in depth, has passed through the laboratory of life.

[1] "Nature has all her facts stereotyped. She writes her events often upon the most fragile plants and flowers, on the very winds and waters — all the most evanescent and changing forms, as well as the most permanent. Her record is as enduring as the phases of the object upon which she writes, and sometimes, as if fearing both would be lost, she petrifies the whole, and leaves it thus to endure for the ages. She has often preserved in stone the history of her frailest leaves, her most ephemeral and minutest insects and infusoria, the record of her ebbing and flowing tides, of the piles of dust blown together by her winds, the footprints of her smallest birds, and of her rain drops falling upon the sand." — *Blackwell.*

Life during this long era was low and simple: but progressive evolution is marked from the beginning to the ending; and fishes of a simple type are finally ushered in: cephalopods, or miniature lobsters, possessing the rudiments of skeleton and nerve centers, with mouth and extensible tongues, prophesied, in dim shadows, the types to come.

The vegetation of the landscape was low and simple, consisting of mosses, sponges, brakes, and other forms, rapid in decay, the fossil evidence of which is therefore obscure; but the plan of the shell life of the seas has not as yet risen above the vegetable form of a simple multiple of cells.

The great drama of life and death has commenced, of progressive evolutions, which is to play while the earth endures.

The geologic evidence of polar changes of the earth, terminating the two former days, is obscure, but astronomy and philosophy unite in giving to the earth a new orbit around the sun, and a new axis of motion, beginning and terminating each of the two preceding days.

Closing the third day, the evidence of a change of the earth's orbit and axis becomes apparent: forming thereby a new equatorial belt, and unbalancing the equilibrium of internal fire, bulging the oceans at a new equator.

These causes broke up and distorted the whole crust of the globe; mountain chains sunk forever into the bowels of the earth's molten sea; and new continents, with new mountains, were upheaved.

The scenes of life are shifted to new sections, with a new map of continents and oceans.

Life must conform to conditions, or become extinct; and it will be the natural sequence in to-morrow's new surroundings for life to be molded into types new and strange; for —

> "He treadeth upon the waves of the sea,
> And overturneth the earth;
> He shaketh the heavens,
> And the earth hath removed out of her place."

Reader, look through the telescope at the planet Saturn, and you will behold centrifugal force forming of the superabundant envelope gigantic external rings; while beneath the blanket of clouds thirty thousand miles in depth, in the warm waters of her seas, amid the crumbling continents of recently upheaved rock, now exist all the types of life and low forms of vegetation described in this chapter.

> "And the evening and the morning were the third day."

CHAPTER XVII.

FOURTH DAY OF THE WORLD'S HISTORY — AGE OF COMING BLUE AND BLAZING SUN — COAL FORESTS AND REIGN OF FISHES — A DESCPIPTION WHICH APPLIES TO THE PRESENT OF THE PLANET JUPITER.

"And God made two great lights,
The greater light to rule the day,
The lesser light to rule the night.
He made the stars also."

The mighty operations of nature may work on in ruin and desolation, but her grandest achievements are accomplished by slow labor through decades of centuries; step by step accomplishing plans, slowly but surely producing gigantic results. Century by century a steady advance takes place which cannot, in its fullness, be recognized save by comparing widely separated ages.

The fourth day covered countless centuries, like the preceding, in which types of life were struggling upward to higher forms.

From morning till mid-day, mosses and brakes were progressing and evolving, slowly but surely, to the grandest forests that ever clothed the earth; and through long ages of wonderful, magic growth, slowly yet surely devouring the poisonous black carbon of the earth's clouded atmosphere, and preparing earth and air for the abode of life.

The great, grand accomplishment of this age stands out so glorious and overwhelming, that the geologist

himself is wrapped in wonder; and for the time being forgets his trail of progressing mollusks and advancing vegetation,—the means and methods of nature's great results; all of this is for the time being forgotten as he takes in the majestic completion of the accomplishment, and beholds for the first time the blue of an ethereal sky, radiant with flashing lights, moving orbs, and sparkling stars; in the pointed language of Genesis this was the age when—

> "God said, Let there be lights in the
> Firmament of the heaven to divide the day
> From the night, and let them be for signs
> And for seasons and for days and for years."

Having thus summed up the accomplished results of this age, let us go back from the ending to the beginning, and read the record in beds of coal and other tables of stone, of the natural progressive methods by which these great results were accomplished.

I will not burden the reader with a laborious dissertation on the old red sandstone formations of Scotland, France, Connecticut, and elsewhere, rich with the fossil rock of progressive fishes, of multitudinous species, and mixed with shells and corals, trilobites, and all the types of former life, in endless gradations, from low to high, up to ganoids, sharks, etc.; but refer those who wish to make a clearer study of these formations to Hugh Miller, Dana, Lyell, Hitchcock, and others.

On the landscape, rapid progress in the evolution of vegetable forms is observed; club-moss has climbed upward to brakes; mushroom puff-balls have become mighty ferns. The cryptogama of the Devonian era has now become the lepidodendrons of mighty carboniferous forests.

Vegetation progressed on the landscape from age to age, and in the noon of full day, the grandest forests that ever clothed this earth shut up their green verdure, devouring the carbon of dark poisonous air, and waved their mighty foliage o'er all the landscape. Strange vegetable forms sprung up, as if by magic, and everywhere on land flourished a wonderful, tropical growth.

The successive strata of carboniferous land and Devonian sea are found overlapping each other, as in succeeding ages continents are upheaved, and the sea recedes or, anon, pours swelling in again; leaving successive deposits in layers, one upon the other, rich with the history of land and sea, since hardened into beds of coal and sand-rock, containing the fossil remains of the fishes which inhabited the seas.

In the oceans of this age fishes, in endless profusion, luxuriate and reign.

Nowhere in the rocky book of nature do we read a page free from death, and here, as elsewhere, is enacted the struggle for existence; the strong prey upon and devour the weak; corals are still at work building up reefs; trilobites, lobsters, and shell-fishes congregate on the shallow shore, with swimming, finny denizens; pursued and overtaken, they furnish food for the more rapacious monsters of the deep. To the strata of rock containing the fossil remains of these early inhabitants of the sea, geologists have given the name "Devonian era."

The luxuriance of the forests which covered the carboniferous landscape, will be in part appreciated when it is considered that a century's growth of present forests would be required to produce a stratum of coal two inches in thickness.

The total depth of the English coal-beds, underlying each other, and separated by Devonian sandstone, is one hundred and fifty feet in thickness, and it cannot be less in America.

Long ages of growth and decay rolled into eternity, and the broken-down débris of these mighty forests formed immense beds of peat and vegetable matter, increasing in depth age by age, as carboniferous matter accumulated.

And it is more than probable that the excessive abundance of carbon in the atmosphere was being deposited with the accumulating vegetable substances in crystal layers, and forming crystal stalactites of carbon, closely allied to later vegetation; in short, the growth of carboniferous vegetation was almost a crystallization.

When we consider the awful depths of the early carboniferous atmosphere, with its damp and murky condition, it is reasonable to suppose that vegetable fungus fell in showers, adding its substance to the accumulating coal measures.

Convulsions of nature sometimes upheaved continents from the ocean, and continents with their accumulated vegetable beds sunk beneath the sea, and the wash of waves and drift-rock, with sand and fossil fish, overrun and deep buried the sites of former forests, to be again upheaved and covered with new forests as luxuriant as before. In the course of ages this process must have been frequently repeated; for in sections of the coal fields there are several distinct strata of coal, one above the other, and separated by layers of sandstone.

Lyell found in a coal field in Nova Scotia, in a section one hundred and fifty feet in thickness, sixty-eight levels or distinct incline planes, the floors of former for-

ests, one upon the other, and separated by thin layers of sandstone; where the trunks of trees were found intact, still flourishing with roots, since changed into coal.

The intervening rocks formed by the wear and wash of the ocean, are sandstone, shale, yellow and gray limestone, — immense beds of wide extent and thickness, and filled more or less with the fossil remains of fishes, shells, and corals.

During the carboniferous age, no land animals appear, no birds fill the air with music. The hum of insects and the croaking of amphibia alone wake the echoes of the dismal forests.

Fishes are modified by new conditions. New species are constantly ushered in, while former species become extinct, the only evidence of their existence being their fossil forms imbedded in rock As Denton remarks in his "Past of Our Planet," "The stars sink one by one in the west, and new stars appear in the east, so, through the night of the past, sunk all forms of life, to be succeeded by the new approach, nearer the dawn of the day in which we live."

The thick clouds of black poisonous carbon, furnishing a vehicle for the still more dense clouds of moisture, which until now had created one continuous night of impenetrable darkness, through which no ray of sunlight had penetrated, is now stored away in immense beds of coal, and the radiant light of heaven's shining orbs comes steaming down. In the meantime, the earth reached the intensity of her ellipse, again assumed a new axis of motion and a new orbit nearer the sun, breaking up the entire crust of the globe.

Reader, look through the telescope at the planet Jupiter, and you behold the belts of fast fading, primitive

nebula, intermingled with the forming pure oxygenized air. Beneath the depths of her cloudy atmosphere, the planet is clothed in a luxuriant, prodigious vegetation, while fishes in endless types swarm in the waters of her seas.

The rays of sunlight, of moon and stars, are beginning to penetrate the depths of air, and flash light and brilliancy over the strange landscape, and cast shadows and changing phenomena—

> "For signs and for seasons and for days and for years.
> And the evening and the morning were the fourth day."

[220] AGE OF REPTILES — FIFTH DAY OF THE WORLD'S HISTORY, AT THE PRESENT TIME REPEATED ON THE ASTEROIDS.

CHAPTER XVIII.

FIFTH DAY OF THE WORLD'S HISTORY — AGE OF CHAOTIC LIFE — THE REPTILIAN ERA — A DESCRIPTION WHICH APPLIES TO THE PRESENT ON THE ASTEROIDS.

"And God said, Let the waters bring
Forth abundantly the moving creature
That hath life, and fowl that may fly
Above the earth in the open firmament of heaven."

The great, startling record of the rocks, beginning the fifth day, is the wide-spread upheavals and distortions which changed the position of former strata, setting the coal measures on end, or forming incline planes, at the surface of which the coal fields still crop out; while in other portions of the earth's surface, they are buried deep with volcanic exudations, and later rock formations.

Great depressions and correspondingly vast upheavals changed the relative position of sea and land. Vast mountain chains broke through the level surface of former plains, and lifted their granite heads high into the sky, leaving the coal measures on either side in inclined layers, or buried deep with volcanic matter.

The whole rocky frame-work of the globe was broken up by the most stupendous convulsions the earth has seen. The coal measures were formed on the fourth day, and had it not been for that night of God's ruin, when he overturned the earth, and broke its shell like a crumbling wafer, which event divides the fourth and fifth days, one hundred and fifty feet of coal, or rather four hundred feet

of peat, would be presented to us, equally distributed over the surface of the earth.

But the hand of design, working in eternal causation, broke in pieces the shell of this earth, burying these beds of peat, with outpouring molten rock; mixing in places carbon with molten lava, producing iron ore; in other localities, compressing and crystallizing peat into coal; driving before it the residue of petroleum. And to-day man has fuel for his hearths, iron for his utensils and machinery, rock for his buildings, mineral for his inventions, and light for the shadows of his pathway.

Had we no other evidence of a sudden polar change and the formation of a new equatorial belt, new antipodes of contracting poles, disturbing the balance of internal fire, and wrecking the shell of a former earth, these rocky evidences would alone be sufficient to establish it; but we have shown by overwhelming astronomical evidence, that the earth has regular periods of sudden polar changes; that the increasing eccentricity of the earth's orbit compel the establishment of a new axis, in approximate periods of six hundred thousand years. In the language of Job,—

> "When he overturneth the earth.
> Which commandeth the sun and it
> Riseth not, and sealeth up the stars;"—

such was the ending of the fourth day, and such was the beginning of the fifth day.

The atmosphere, freed from the overhanging black drapery of poisonous carbon, it having been devoured by the forests of the preceding age, is now stored away in mighty coal measures.

Considering, therefore, the changes in earth, air, and sea; the mighty deluge which has swept over forests of

Fossil Bones of Plesiosaurus and Pterodactyl, Extinct Monsters Which Inhabited the Earth in Its Fifth Day.

waving foliage ; and continents of polar ice, now melting in the glare of a torrid sun ; and a new-born sunlight, streaming in brilliancy over all the landscape, have we not a right to expect great changes, metamorphoses, and unfoldings in all the former types of life?

We read a prophecy in the progressive evolutions of the fishes of the third day, and saw its fulfillment in the fourth, in an age of the reign of fishes. In the fourth day we had noticed the development of enormous fins, prophesying wings, and a few species of fishes becoming batrachia had prophesied air-breathing animals ; now behold in the fifth day the fulfillment of prophecy.

Conform to conditions or become extinct ; grow in a new soil or die ; change with new environments ; leap into a new life, under the fiat of nature ; be metamorphosed by sunlight and air, or take your tomb in fossil rock!

Behold after long trains of progressive evolutions, during which time the turmoil of elements has become settled into the calm stillness of God's fifth day ; behold a type of life new and strange,— an innumerable caravan of fowls ; flying, creeping, crawling, swimming. It is the age of reptiles ; they bask in the stagnant water, hover in the air, and swarm on the land.

> "God said, Let the waters bring forth
> Abundantly the moving creature,
> Fowl that may fly above the earth,
> In the open firmament of heaven."

It is thus plainly declared, and Job also affirms that life was formed in the waters, and the inhabitants —

> "The root was spread out in the waters,
> He draweth me out of the waters ;"

and we herein see that all life had its progressive beginning in water; the fishes of the Devonian era were the ancestral seed from which sprung the reptiles of the fifth day.

In this reptilian age we behold the first great outbreak of nature, in the almost spontaneous production of countless living forms, seemingly without a plan. It was the age of conglomerate life. Like the magic crystalline forests of the preceding day, the fifth day was the mushroom magic of incongruous life, a chaos of living forms in the nebular state, where no course of natural selection had as yet separated into kingdoms, types, and species, and perfected nature's various plans of beauty and utility.

In this age we view the chaos, the dawn, the dream, the prophecy of what shall follow; the discordant conglomeration of material, upon which nature shall work, modifying, chiseling, developing, until she perfects all the varied types of present existing species.

We are confronted in this reptilian age with a strange panorama of living forms, half fish and half mammal, half fish and half bird, half fish and half human; but we seek in vain for types of life approaching the present order. With wings or fins, with claws or webs, with shells or scales; swimming, crawling, flying, hopping, moves the mighty caravan of reptiles.

If it were possible to believe in the pictured representations of Grecian gods, in which the parts of beings are wrongly combined, we could find it here, brought together as if by chance or experiment,—a wondrous array of creatures, in whose make-up heads and bodies, wings and limbs, parts and organs, are mixed as if in wild disorder; the head of a dog on a shelled armadillo, the wings of an ostrich attached to a serpent, the head and neck of a giraffe rising out of the water from the

body of a fish, a human body, with the hands and feet connected with the long limbs and head of an enormous frog; all adjusting themselves more or less to their strange environments, whether of air, water, or on land. Strange history of histories in the epochs of the tremendous past!

The plesiosaurus arches his long neck, the ichthyosaurus flaps its huge paddles, the hylaeosaurus, larger than the elephant, drags on the shore and stupidly gazes on the scene, save when the pterodactyl, or winged dragon, plunges upon its antagonist. Huge frogs leap in wild disorder, and sea serpents dart to and fro. The iguanodon tramples down the tree ferns and feeds on its leaves; the megalosaurus pursues its prey with thundering roar, while high above, reptilian birds fly screeching in mid air, or dash with huge wings the ocean's white foam.

Land and sea witnessed terrible encounters between these voracious monsters. Their colossal forms seemed made for deadly strife; fierce and savage dispositions are pictured in strong jaws, jagged teeth, and vice-like, pointed claws.

Terrified birds plunged shrieking through the air, a thousand voices pealed in hoarse tones over the land, and reverberated on the sea, as these mighty combatants grappled in deadly strife, and rent the air with thundering roar or dying groan, while poured rivulets of blood from lacerated veins. The struggle for existence is here enacted on a grand scale, and the heroes of the combat are the sires of the future.

The fossil remains of the beings we have described are found in abundance in cretaceous, jurassic, and triassic rock; also in brown, yellow, and red sandstone, lias, oölite, and wealden foreign quarries.

The fossil remains of these extinct beings have been

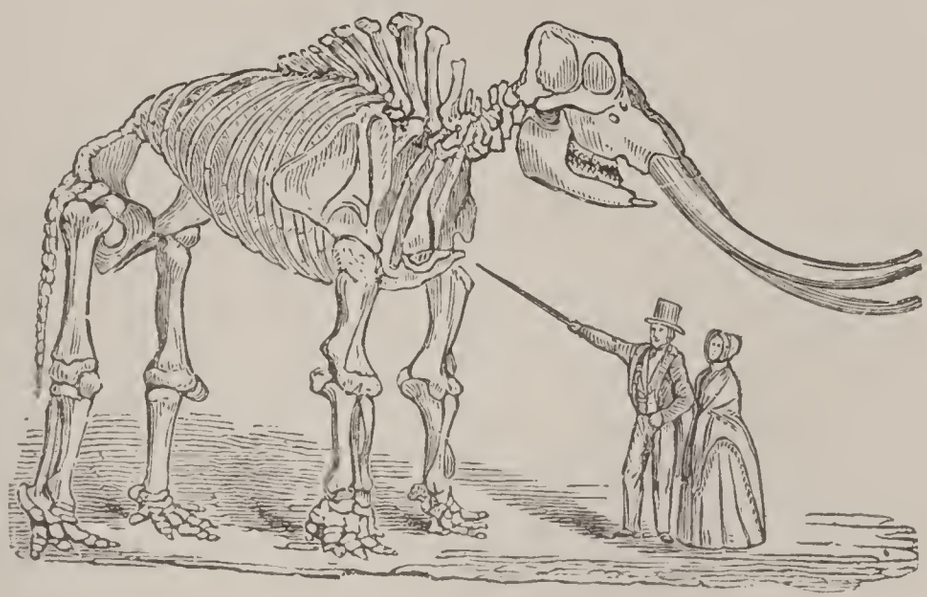
collected in American and foreign museums, with slabs of stone containing their foot-prints, by which means their wondrous history is deciphered.

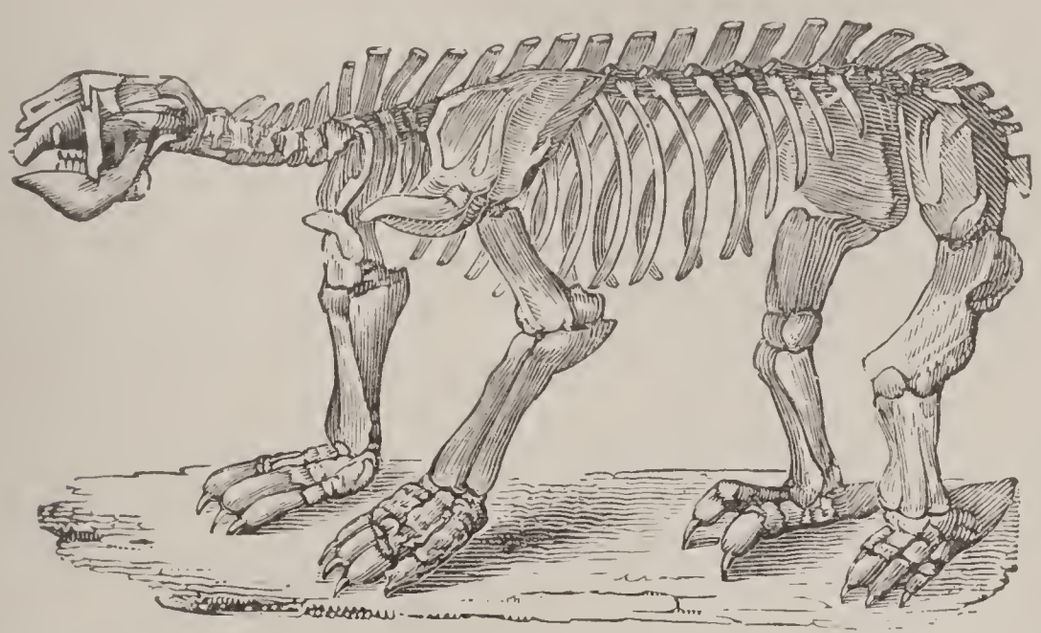
It is a solemn and impressive thought that the fossil remains and foot-prints of these dumb and senseless creatures have been preserved in all their perfection for thousands of ages, while so many of the works of man, which date but a century back, have been obliterated from the records of time. Kings and conquerors have marched at the head of armies across continents, and piled up aggregates of human suffering and experience to the heavens, and all the physical traces of their march have totally disappeared; but the reptile which glided along the margins of a Scottish inlet, before the human race was born, left foot-prints, and dying, their fossil forms, in the soft and shining sand, when it was hardening into rock, which the rising or sinking of continents has not obliterated.

The fifth era began as did the preceding day, by an axial change of the earth and a new and nearer orbit around the sun, again breaking and distorting the whole rocky frame-work of the globe.

Reader, look with the telescope into the asteroid belt of small planets. Behold Ceres, Pallas, Juno, and Vesta, with ice-covered arctic poles, with temperate regions and torrid zones; look down through their pure atmosphere, sometimes slightly clouded like our own; behold on them oceans and continents, with mountains and rivers, hills and dales; imagine the abundant outbreak of reptilian life, all the geologic monsters of the earth's reptilian age, at which period of the world's history —

> "The waters brought forth abundantly,
> And the evening and the morning were the fifth day."





Fossil Bones of the Megatherium and Mastodon, Extinct Animals, now Inhabiting the Planet Mars.

CHAPTER XIX.

SIXTH DAY OF THE WORLD'S HISTORY — AGE OF CHANGING SKELETON AND COMING BRAIN — A DESCRIPTION WHICH APPLIES TO THE PRESENT ON THE PLANET MARS.

The reconstruction of axis, and the new and nearer orbit of the earth around the sun, which marks the opening of the sixth day, and convulsed the rocky frame-work of the globe, lifting higher the mountains by a new upheaval, or sinking them with whole continents beneath rolling seas, changed again the entire relative positions of sea and land.

Polar night gathers about the antipodes of a former equator; while continents of arctic ice lift their white bosoms and cold, crystal, mountain heads to the glare of a torrid sun; and the warm water of the oceans comes pouring in, unlocking the ice barriers, and forming stupendous glaciers, which are borne slowly away, in extensive deep strata of crystal white; planing the mountains and chiseling their rocks into fragments, finally breaking into detached icebergs, loaded with boulders and drift-rock, which float far off into melting seas.

I am aware that the glacial epoch has been an inexplicable mystery to geologists, and that they are in the habit of assigning only one such era as having occurred in all the past. The evidences of glacial action are numerous, and can be found in almost every part of the inhabited globe. Finding them the natural product of the changes of the earth's polar position, local in ex-

tent and time, we are forced to the conclusion that there has been not one, but many such eras; they were present following all the later changes of the earth's axis.

The sixth day, commencing as it did by an overturning of the earth itself, wrecking the crust by stupendous earthquakes and volcanoes; added to the agitated oceans, stalking in tidal waves, with a mighty flood sweeping over the landscape, in contact with continents of melting ice, and a long glacial period; while frigid cold gathers about the two antipodes of former equatorial regions; making thereby a new atlas of the earth itself, and producing radical changes in air, water, and soil, also in the climatic conditions necessary for life; under the rays of a new and brighter sun, shall we not expect wondrous changes in all the struggling forms and types of life?

These universal changes were the death-knell to the great saurian tribes; the few which escaped the first ingulfing maelstrom of death, were stunned and dwarfed by new conditions of cold and climate, and one by one took their places in the oblivion of the past.

Survive or perish, conform to conditions, respond to environments, become acclimated, were the imperative demands of nature; and these saurians, suddenly transported into a new soil and climate, perished in countless millions on the earth. But a few take root and live, metamorphosed by conditions, transformed as if by cultivation, by a process of physical molding so radical that the few alone survived.

The creative fiat, in eternal causation, demanded a higher type of life, and the forces of its molding were terrific and severe; all the elements were brought to bear, to change, transform, and make new. There was a

terrific struggle for existence, in which the fittest alone survived, with the law of parentage marking progeny, and arming its offspring to successful combat against the forces of its own destruction. The law of correlation and harmony of parts, forced radical changes in the whole anatomy, keeping pace with slight changes in given parts; head and limbs kept pace with advancing skeleton, and hand and foot were modified by advancing brain.

New and higher types sprung from sources where least expected, crossings and amalgamations were even more numerous then than now.

Conform to conditions, change or perish, was the fiat of nature. By this law the twigs and brakes of the Alps and Andes become the giants of tropical valleys; the stunned weeds of the mountains in the valleys become mighty ferns and cedars, covering acres with their shadows; while the hardy giants of the valleys, pine and maple, high up near the line of perpetual snow, become dwarfed, bushy weeds. The minnows of our cold streams become great fish in deeper waters, and the blind fish of the Mammoth Cave and other dark caverns, when bred in sunny waters, after a few generations transmit to their offspring fully developed eyes; — such is the force of environments; such the iron hand of nature's moldings; such the fiat of creative causation.

Standing here on the threshold of the sixth day, amid the stupendous changes in air, climate, water, and sky; upon a new earth, under a new heaven, where flashes down a nearer, larger, and brighter sun, surrounded with new oceans, where millions of saurians are battling with the elements for their lives; will it be out of the radius of natural expectations, if in coming generations we behold a new panorama of life, a caravan of living beings, totally

unlike their parentage of preceding ages, and approaching nearer the dawn of the day in which we live? Let us then take a rapid survey of the life of the sixth day.

Cuvier was the first to collect the fossil skeletons of mammals, mastodons, and numerous extinct species of the tertiary age: but more recently naturalists have filled the museums with the once living forms of this era. The deposits in which they are found consist of drift, sand, upper sandstones, clay, chalk, peat, pebbles, etc., constituting essentially the surface strata of the globe. Changes, however, in the earth's crust, by the last great deluge, somewhat modify this statement.

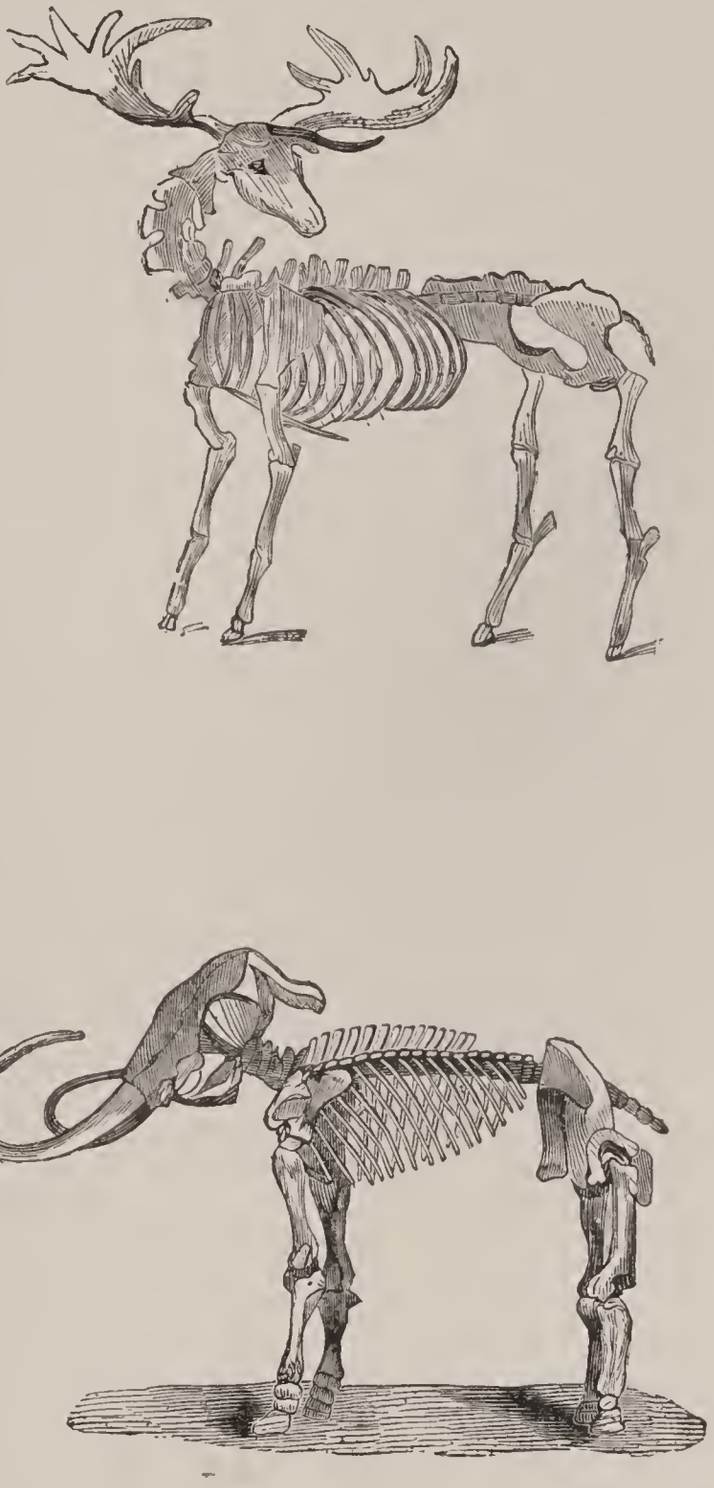
The scenery of the sixth day had all the sublimity and grandeur of the present; the billows sang the requiem of entombed monsters, but equally gigantic monsters supplied their places. In the dense forests and through the tangled jungles moved numerous forms of life, browsing the herbage, or preying on each other.

Dinotherium, or the terrible beast, roared in the swamps; mammoths, rhinoceroses, mastodons, elephants, hippopotamuses, the alligator, and the gavial, existed in their native wilds.

The cry of wolves and foxes rang through the forests, mingled with the deep guttural tones of bears and hyenas; the wild horse, reindeer, and antelope, the opossum, kangaroo, and elk, in short, many of the now existing types of animal life, were represented.

Birds of varied plumage hovered in the trees and filled the air with song.

Among the trees, tribes of monkeys of various sizes, color, and species sported in playful glee; and it has been demonstrated by Tipinard, the French anthropologist and others, that various beasts in half human form



Extinct Antediluvian Monsters. Fossil Bones of Mammoth and Elk.

existed, in some respects resembling, but more varied in type and species than, the present existing tribes of gorillas, orangs, monkeys, apes, and chimpanzees.

This day represented a period of time, as we have shown by astronomical reckonings, of approximately six hundred thousand years, and perhaps continued until the last great deluge.

The higher we ascend in the strata of the sixth day, the nearer do fossil forms approach the appearance of present species; and this is true conversely, the beginning of the age as indicated by underlying strata is marked by the close resemblance of earlier fossil forms, and the intermingling of the saurians of the fifth day.

The sixth day was an age of steady unfolding and progress; one by one types and families of life became extinct, and one by one higher types took their places. Types, tribes, and races were crossing and amalgamating, and climbing upward to new forms, and here and there assuming face, hand, and form, with erect bearing, and prophesying future man.

"God said, Let us make man in our image."

We will leave this age here in the middle of the record, both as regards the testimony of the rocks and the testimony of the Bible, and after discussing other subjects, already implied, we will return to the thread of our connection. Let it be remembered, then, that we drop our history here in the middle of the sixth day, hereafter to consider the remainder of the long era when man arose from the garden of Eden, and enacted mighty volumes of a long, tremendous history before the flood.

Reader, look with the telescope at the planet Mars; see the clear outline of her arctic and antarctic regions,

covered with white crystal continents of ice and snow. Behold her temperate and tropical belts, see the white line extending towards the equator in winter, and receding towards the poles in summer; the oceans can be distinguished by a greenish tinge, and the valleys intervening between mountains capped in white, present a bluish hue.

Here is being enacted again all the wild, weird, picturesque scenes and varied phenomena, with the beautiful changing landscapes, of the earth's sixth day. Here are oceans of transparent blue, and waters of variegated green, dashing mighty tides at regular intervals, amid continents of grandeur and isles of summer-eden. Here are magnificent mountains, with grand heads of white reaching heavenward; here are majestic rivers, pouring out cataracts of foaming water, wreathed in rainbows. Here are valleys with cold, gushing springs, and streams reflecting silver from a genial sun; here are forests of magnificent trees, wafting lights and shades; here are prairies of rank grasses beautified with flowers.

Here on the planet Mars is being enacted the panorama of life and death; a long carnival of animal life, and among them gorillas, chimpanzees, orangs, apes, and monkeys, while from the hidden recesses of caves, emerge half human and various savage forms. Not in God's image, no; but beings with form and contour of man, caricatures of humanity, in whose brain has been planted a rising cunning and seed of reason; into whose nostrils is being reflected the breath of life, with a dim conception of right and wrong, to become a living soul.

In yon bright valley, carpeted with green and sparkling with ten thousand colored flowers, where singing birds are making a happy concert with whispering zeph-

yrs and purling rills; a place of divine beauty, a paradise of fruit-bearing trees, a veritable garden of Eden; here God created man in his own image, infusing into his heart the leaven of love and reason.

Here Adamah and Heva nursed and nurtured their rising family. From this valley went out Nimero the mighty hunter, from whom sprung Zabal, father of all the tribes now dwelling in tents; who was the ancestral seed and parent of Noral, the praying hermit of yonder mountain; who with his family, and a chosen few, are now engaged in the building of a rude strange ship.

Around him, on every side, in every valley, on all the continents, prowl half human monsters, savages of fierce and terrible aspect, brutal men, with heads receding and protruding jaws, with alert, secretive step, ready to pounce on their prey.

For the sake of progress and a future higher humanity, let fall the earthquake, the thunderbolt, and flood, axial changes, and a new orbit; convulse with fire and water the planet Mars; wipe out the sin and crime, the degradation and misery; but rescue the builders of the ship, with its precious, selected freight and seed of life, to replenish and re-inhabit the continents of beauty, the isles of Eden.

CHAPTER XX.

GEOLOGIC SUMMING UP — TIME IS LONG — GLACIAL ERAS.

"If all the books were written, the
World itself would not contain them."

The explored strata of the earth are meager, when compared with the unexplored portions of the earth's crust. Only a small portion of the earth's crust is accessible to man; four fifths of its entire surface are covered with water, and polar ice buries the antipodes of two mighty continents, while impenetrable wildernesses still occupy the greater part of the remaining portion.

Thus confined to a few limited points of the earth, and here only the surface is presented to the student of nature; true, the upheavals which have taken place in all the ages have lifted to the surface various underlying strata; from these isolated leaves we have deduced a history.

In these rock records, however, the general order of progressive evolution is clear; the known facts of geology, therefore, stand out like broken fragments of numerals in a long column of figures, 1–2–5–9–10. At the bottom, geology finds corals; next above, it discovers shells; higher still, it finds fossil fishes; above, it discovers rock containing reptiles; and still higher, it finds the remains of mammals; above all, is found human fossils.

The record of all explored rock has never deviated from the order of advance; true, there are wide chasms of unexplored rock in this progressive column of numerals; but in the same manner as astronomy predicted, weighed, and measured Uranus and the asteroids in vacant, unexplored gaps between planets, and their predictions were verified by the telescope, in like manner it is the province of geology to fill up the chasms, and we have a complete order of progressive numerals, 1–2–3–4–5–6–7–8–9, etc.

Hence it is the natural inference that the higher have been evolved from the lower,—that the last were the progeny of the first. In the study of geology we are constantly impressed with the tremendous periods of time, the long ages required to form even a single stratum of the earth's crust. The mind, bewildered, confounded, in its attempt to fathom these flights of time, has asked if geology be not the book of eternity:—what room for every-day changes to heap up wonders; for life to climb upward, through slow, painful progress, through birth and death, growth and decay, holding in its make the same clay that lived in other forms, yet leaving behind, in ruin and in rock, the débris of death heaped upon death, skeleton heaped upon skeleton, forming on the surface of the globe a crust miles in depth of the great tomb of death.

What cycles of ages! What eternities lie behind us in the past history of our globe! And these eternities give ample room if there is any tendency towards progress, to produce in the long train of generations, from the paleozoic fishes of the first seas, to the present time, this being with brain and hand, of heavenward glance, seizing

the lightnings and compelling the elements to become his subservient slaves.

Louis Agassiz, in speaking of geologic time, says: "Among the astounding discoveries of modern science, is that of the immense periods that have passed in the gradual formations of the earth. So vast were the cycles of the time preceding even the appearance of man on the surface of our globe, that our own period seems as yesterday when compared with the epochs that have gone before it. Had we only the evidence of the deposits of rocks heaped above each other in regular strata, by the slow accumulations of materials, they alone would convince us of the long and slow maturing of God's work on earth; but when we add to these successive populations of whose life this world has been the theater, and whose remains are hidden in the rocks, into which the mud, sand, or soil, of whatever kind on which they lived, has hardened in the course of time; or the enormous change of mountains, whose upheaval divided these periods of quiet accumulation by great convulsions; or the changes of a different nature in the configuration of our globe, as the sinking of land beneath the ocean, or the gradual rising of continents and islands above it; or the slow growth of the coral reefs,—those wonderful sea-walks, raised by the ocean architects, whose own bodies furnish both the building stone and cement that binds them together, who have worked so busily during the long centuries that there are extensive mountain plateaus and islands, and long lines of coast consisting solely of their remains; or the countless forests that have grown up, flourished, died, and decayed, to fill the store-houses of coal that feed the fires of the human race. If we consider all these records of the past, the intellect fails to grasp a chronology of which our

SURVIVORS OF THE GLACIAL EPOCH. [243]

experience furnishes us no data, and time that flies behind us seems as much an eternity to our conception as the future that stretches indefinitely before us."

Lyell has well remarked, the extent and thickness of our sedimentary formations are the result and the measure of the denudations which the earth's crust has elsewhere undergone, therefore a man should examine for himself the great piles of superimposed strata, and watch the results of the sea bringing down mud as the waves wear away the cliffs in order to comprehend something about the duration of past time, the monuments of which we see all around us.

The ocean has been the great leveler by which hills and mountains have been washed away and strewn over its coralline floor; its waves never rest; ceaseless as the march of time, in gentle, calm, or angry storm, it labors on in its self-appointed task.

Says Darwin, "It is good to wander along the coast, when formed of moderately hard rocks, and mark the progress of degradation. The tides in most cases reach the cliffs only for a short time twice a day, and the waves eat into them in proportion as they are charged with sand or pebbles; at last the base of the cliff is undermined, huge fragments fall down, and the parts remaining have to be worn away atom by atom, until, being reduced in size, they can be rolled about by the waves, when they are more quickly ground into pebbles, sand, or mud; but how often do we see along the base of retreating cliffs rounded boulders all thickly clothed with marine productions, showing how little they are abraded, and how seldom they are rolled about. Moreover, if we follow for a few miles any line of rocky cliff which is undergoing degradation, we find that it is only here and there, along

a short length, that the cliffs are at the present time suffering; and the vegetation growing elsewhere on the shores conveys an idea of the years that have elapsed since the waters washed their base."

Steel remarks: "Estimating the past by the present rate of change, it must be immense, so that even if we could express it in centuries and years, we could form no idea of the aggregate any more than we can comprehend the distances that separate our earth from the fixed stars. This idea of immense duration of time is suggested at the first examination of the stratified rocks. All that geology attempts, at present, is to arrange in regular order the various stages of progress in the history of the earth's crust, leaving it for the future to decide upon the length of the different epochs. As yet we know only that '*time is long*,' and hence estimate it by ages, eras, and periods, rarely venturing more than an occasional hint at their relative duration. There is an eternity of time as well as of space in which God works out his almighty plan of creation. Whatever may have been our preconceived notions, we should come to the study of nature with a reverent, teachable spirit, seeking to learn its mysteries, to comprehend its plan, and to understand the ways of him who created all things."

Before closing this chapter and the geologic part of this work, we will mention a few facts, in support of our position, that the earth has revolved on other polar centers, and that arctic ice has at different periods of the world's history covered nearly every portion of its surface, and that immense glaciers, with detached icebergs, have left their records on almost every known continent and island.

Beds of rock and earth are found in various places on both continents, in both hemispheres, left deposited on other strata totally different in character from each other; granite, gneiss, trap, and various other substances are now found often on top of limestone shale and clay, often in great aggregations. These rocks and substances are often worn and grooved, bearing the same marks of transportation that are now found in the glacial deposits of the arctic circle. The nearest places where these boulders are found mingled with rock of a like character in their native bed, are often hundreds of miles distant. The boulders, or "lost rocks," as they are sometimes called, are found in North and South America, in Europe, Asia, and Africa, bearing the marks of glacial grooves.

Lyell has discovered the marks and boulders above enumerated on the Alps, high up above present glaciers. The average height of the Jura Mountains is about one third that of the Alps; these mountains are now destitute of glaciers, yet they present almost everywhere moraines or deposits of rock and boulders foreign to them, also polished and grooved surfaces made by glacial action, a phenomenon which has perplexed the geologists for more than a half century. The conclusion is incontestible that the numerous angular blocks of granite came from the Alps, fitting as they do the exact dimensions, with every seam intact, the assumed place of their native bed. These boulders and blocks of stone were transported a distance of over fifty miles, across one of the deepest valleys on the globe, so that these granite blocks are now found deposited on the hills and valleys of a stratum composed of limestone and other formations totally unlike the rock of the Alps. Their great size and angularity after a

journey of so many miles have justly excited wonder, hundreds of them being larger than cottages; and one in particular, known by the name of "Pierre," rests on a hill nine hundred feet high and is two hundred feet in circumference. The only possible explanation of the transportation of these rocks is in rafts of early ice, when the Alps were in the oceans of ice-covered arctic regions.

In Greenland, on its western coast, is a glacier one thousand miles long, having a perpendicular wall of ice two thousand feet high; unlike the Alpine glaciers, which melt in the warm valleys below them, this Greenland glacier empties into the ocean, and breaking into detached fragments, or mountain icebergs, floats away to be dissolved in the warm water of southern seas; thousands of these icebergs, freighted with the rock they have torn from underlying ledges, constituting immense boulders, now throng the northern oceans, floating south with their burdens of rock.

Could we examine the trough of these ice-rafts, we would doubtless find, as to-day we find in the boulders of the Alps and elsewhere on every continent, scratches or plowed grooves and polished surfaces, in blocks deposited in long trains, where the blocks have scraped along by their momentum, and at last stranded; depositing their load on the top of petrified forests, coral reefs, or sandstone made up of living remains. In this manner, transported by ice, is found the evidences of arctic seas, with continents of ice which once covered, not only the North American continent, but the South American continent also; and at another period, Africa, and at still other periods, Europe, Asia, and Australia; such boulders and grooved rocks being found deposited in great moraines,

among and upon all the mountains in all the continents named.

There are river channels of the Old World, back of not merely one, but perhaps a number, of the earth's polar changes. These ancient abandoned river-courses are frequently found by excavations, mines, artesian wells, when boring for oil, etc.

While digging a canal to the mills of Lowell, Massachusetts, an old river-bed was found under the drift, the upper plane of which had since been leveled by the carriage and action of ice.

Mr. Croll believes that the last great glacial period occurred two hundred and fifty thousand years ago, having endured for one hundred and sixty thousand years.

With respect to more ancient glacial periods, several eminent geologists believe that they occurred during the miocene and eocene formations.

In the "Origin of the Species," page 236, Darwin quotes the following authorities, in his own language: "There are evidences of glacial action in Africa, and along the Himalayas at points nine hundred miles apart. Southward of the Asiatic continent we know from the excellent researches of Dr. Hast and Dr. Hector that in New Zealand immense glaciers formerly ascended to a high level, telling the same story of a cold period. It appears that there are traces of former glacial action on the mountains of Australia. Erratic boulders have been noticed on the Rocky Mountains, in the Corderilla of South America nearly under the equator. In central Chili I examined a vast mound of *detritus* with great boulders crossing the Portillo Valley, which once formed a huge glacial moraine."

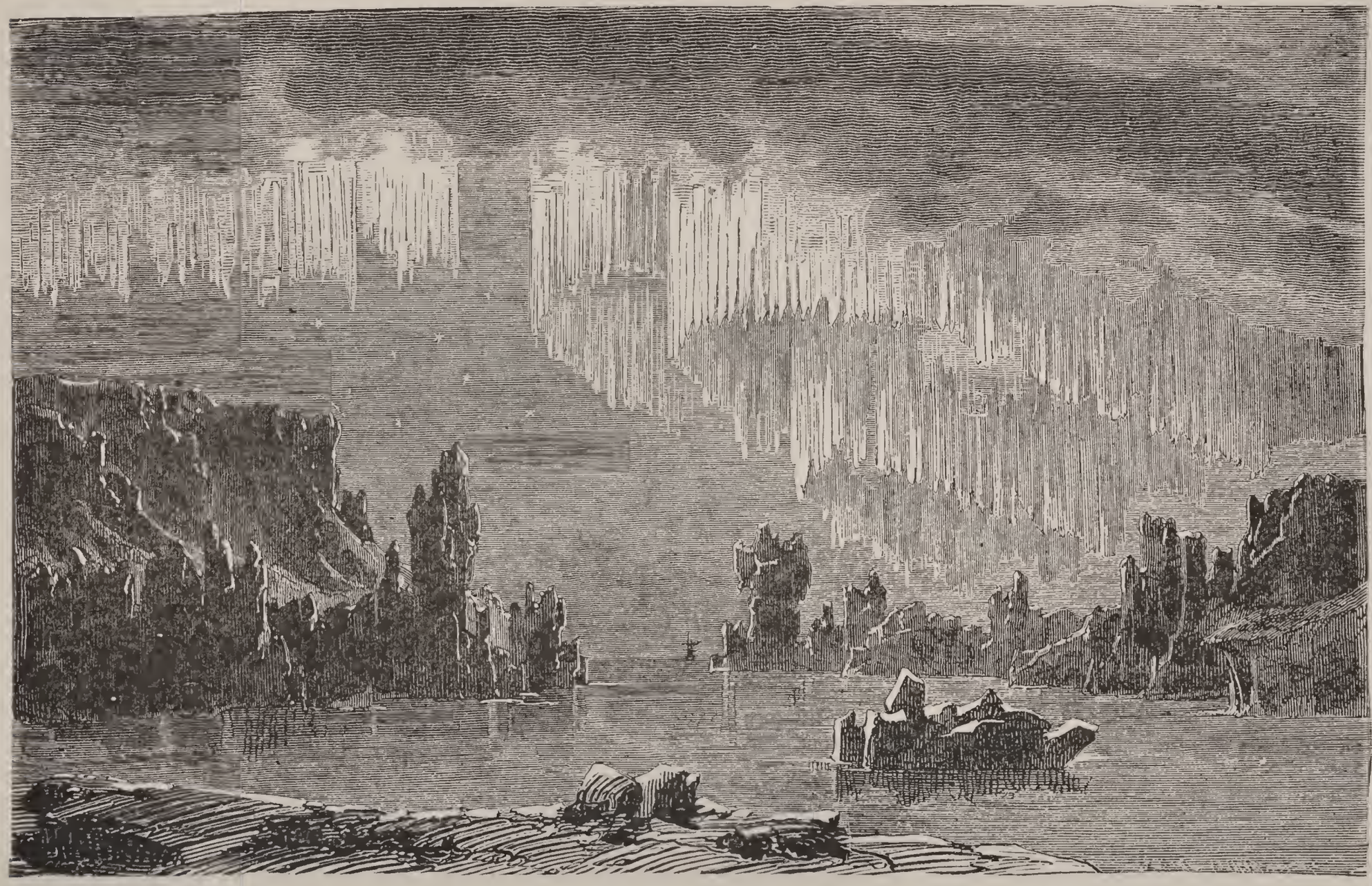
There is a glacial moraine in Massachusetts extending hundreds of miles; angular blocks of slate were torn from the mountains of Camden county, New York State, and are deposited in a train running southeast obliquely over mountain ridges, hills, and valleys. One of the huge slate blocks is now deposited in Berkshire county; it contains sixteen hundred cubit feet, and can be located in its native bed in the York mountains.

The theory most generally accepted by geologists to account for this array of glacial facts, is that the earth slowly oscillates from pole to pole, extending the ice-covered arctic region to the equator first in the northern, then as it recedes and the earth oscillates, comes an ice period to the southern hemisphere.

In the flood of light which our studies on the earth's axial, orbital, and elliptic motion has brought to us, the explanation of glacial periods becomes clear, and add their weight of evidence to facts from other sources, that the earth has revolved on other axial centers and pursued other orbits around the sun.

That in periods of approximately six hundred thousand years, the earth's momentum is suddenly overthrown by atmospheric currents, and our world is compelled to assume a new axis of motion, bringing the ice regions suddenly under the glare of a tropical sun, to form glaciers and icebergs, and melting, leave there evidence on temperate or tropical landscapes.

The glacial periods have been the mystery of geologists, but are made clear and simple in the light of sudden polar changes.



AURORA BOREALIS, AS OBSERVED BY DR. FRANKLIN IN THE ARCTIC REGIONS. [251]

CHAPTER XXI.

WHIRLWIND AND DELUGE OF FIRE—SODOM AND GOMORRAH.

"And the stars of heaven fell upon the earth:
Even as a fig-tree casteth her untimely figs
When she is shaken of a mighty wind.
Then the Lord rained upon Sodom and Gomorrah
Brimstone and fire, from the Lord out of heaven."

There was a time far back in the eternities when our sun, with all his brood of shining planets, was a cosmos of unorganized matter, "without form and void." The substance of our sun and system filled the boundaries of the most remote planets with one stupendous nebula.

From this chaos of material, gathered and condensed by the slow process of cometary fires, has come our sun and an infinite brood of planets; comets still swarm our system, drinking up the residual gases of the planetary spaces; and extensive fields of the original cosmos fill vast regions of the solar system, intermingled with, and holding gossamer folds between the planets, in the form of the Aurora Borealis.

When we consider the rapidity of the earth's axial and orbital motion, and look through the earth's atmosphere into the adjacent space, oftentimes filled with cosmic matter, aglow with light, is it any wonder that the northern lights should thus show lightning flashes and streaming prisms of rapidly fleeting colors?

You have looked out of a rapidly-moving car window, and experienced nearly the same phenomenon on a minute scale; our world spins with almost lightning speed, and the gossamer folds a few hundred miles above us, flash by like an electric display.

The number of lesser and outer planets belonging to our system, is unknown. One hundred and fifty asteroids have been counted, and astronomers compute that one hundred and fifty thousand of these small planets exist in the gap between Mars and Jupiter.

Going outward near the orbits of the remote planets, small bodies could not be distinguished, even by the aid of powerful telescopes. The smaller planets, as such, belonging to our system are, without doubt, more numerous than has been conceived; so also of comets. Lalande had a list of seven hundred comets observed in his day; Arago estimated that the comets belonging to our solar system, within, or liable to come within, the orbit of Neptune, numbered seventeen million; while Lambert regards five hundred million as a moderate estimate. Thus planets and comets are scattered through the heavens with as much profusion as the fishes in the sea.

The stupendous body of the sun itself has been built up by a continous rain-fall of planets, comets, meteors, and cosmic matter; by which source his fires are constantly replenished, and rays of heat, light, and caloric force sent back again, to replenish the cosmic, nebulous meadows of space.

That planets sometimes collide, drawn together by attraction, forming thereby larger bodies, is plausible and probable; and that planets sometimes become enveloped in comets, uniting with the nucleus in a new glow of fire,

attracting the oscillating tail into a new and more extensive atmosphere, is also a proposition sanctioned by logic.

In the year 1779, Lexell's comet approached so near the earth as to excite serious apprehension; the comet crossed the earth's orbit one month prior to the earth, and going outward passed through the midst of Jupiter's satellites, and became temporarily entangled among them.

Says Ignasius Donnelly, "The comet might have covered Jupiter one hundred feet thick; yes, a hundred miles, with gravel and clay, and formed clouds of her seas five hundred miles in thickness, without our knowing anything about it," even by the aid of the most powerful telescopes, hundreds of miles appearing only as a dot or line in the immense distance. The comet, however, was greatly demoralized by the contact; she lost her original orbit, went mysteriously out into space, and has never been heard of since: unless the planet Neptune, shortly afterwards discovered by Galen, was the product of her reorganized and reconstructed substance.

It is not unreasonable to suppose that an event which thus demoralized the comet may have caused it to cast down a considerable portion of its material on the face of Jupiter. "The period of Encke's comet around the sun is constantly diminishing, so that if this progressive diminution continues always at the same rate, the time when the comet will be plunged into the sun can be calculated." When we consider the numerous comets around us, and when we remember how near some of them have come to the earth in the last few years, if we believe the astronomers; who will undertake to say, during the long periods of the earth's history, what erratic luminaries with blazing front and train of meteors may not have come in collision with the earth?

The earth everywhere presents evidence of external fiery contact, and perhaps, as ably asserted by Ignasius Donnelly in his "Age of Fire and Gravel," a considerable part of the underlying or overlying substances of the earth may have been the result of precipitation from cometous contact.

"We are astonished," says Humboldt, "at being able to touch, weigh, and chemically decompose substances which belong to the outer world, to celestial space; to find in them the materials of our native earth, making it possible, as the great Newton conjectured, that the materials which belong to one group of cosmical bodies are for the most part the same," having had a common origin in that early cyclone, tempest, and wreck of former suns and systems, which diffused matter and force into infinite space, and made possible the birth and development of our stellar system.

The eminent German geologist, Dr. Hahn, has recently discovered in meteoric stones of the class called chromidites, principles by which he identifies them as belonging to classes of sponges or corals; Dr. Weinland, another distinguished German, corroborates these discoveries, and he has also found in meteoric stones, chalk, very much like the youngest marine chalk in the Gulf of Mexico, and he declares that under the microscope he finds traces of vegetable growth. Francis Brigham says, "This entire ex-terrestrial fauna hitherto discovered, which already comprise about fifty different species, obtained from different meteoric falls, conveys the impression that it once formed part of an ex-terrestrial celestial body, with a unique creation, which in by-gone ages was overtaken by a grand catastrophe, and diffused into fragments. When we remember that meteors are generally

believed to be the dross of elements identical with the substances which compose comets, these facts come very near to prove that this is no new creation, for only under conditions similar to our own can we suppose life ever existed, for there was required for the growth of these meteoric corals, sponges, and crenoids, water, air, and sunshine, and a temperature between the degrees of fire and freezing cold.

In speaking of the fact that the heavenly bodies are formed of the same material as our globe, Dana says, "Meteoric stones exemplify the same chemical and crystalline laws as the earth, and have afforded no new element or principle of any kind."

How much of the dust and surface substance of the earth has been precipitated upon it from without in the form of meteors and contact with comets, science is yet unable to determine. But that the earth has a number of times actually passed through extensive tracts of nebula, or comets, is the almost universal opinion of astronomers. It is probable that the inhabited world has witnessed such fiery ordeals; that Sodom and Gomorrah were destroyed and portions of the world denuded with fire and meteoric stones which fell from heaven.

Legends, handed down to us, of the destruction of the ancient world by fire raining down from heaven, are as numerous among the tongues and nations of the earth, as are legends of its destruction by a great deluge of water.

The "flaming sword" of Genesis, coming in between our world and the garden of Eden, is supposed to symbolize the Edenic condition of our world, prior to its destruction by a comet; and Job becomes intelligible in this light when he refers to the "crooked" and "winding serpent," "Leviathan:"

"The apostate dragon, when he poured dust
On the earth and the clods hardened together;
His body is like molten shields shut close up;
Before him go burning lamps like torches of fire."

Such sentences have no meaning unless descriptive of the earth's collision with a comet, and the fire and meteors which fell from it.

Written in the rocky pages of the earth are records of visitations from the comets. No traces are left of their destructive power save huge deposits of charred substances locked away between great layers of sedimentary rocks.

And here we stumble over a still more tremendous fact told by Professor Winchell, that the granite, the foundation of all our rocks, the primitive molten crust of the original, glowing ball of the earth when it hardened as it cooled,— this ancient globe-crust is itself made up of particles of sedimentary rocks which were melted, fused, and run together in a conflagration of fire.

Even here in the granite, the foundation-floor of the world, is a record of seas and shores, winds and rains, rivers and sediment, carried into the waters to form the atoms melted up in this granite.

Not the present only, but many orders of suns and systems, lie behind us in eternity; and possibly in the very matter composing this granite were the remains of animals and man, melted and fused together.

Who shall count the ebbs and flows of eternity? who shall count the possibilities of matter and force, which are eternal? What rain-falls of stars, what collidings and mixings of elements, what destructions of former universes, what endless series of new systems and new suns with their appendages of inhabitable worlds, the

eternity of God may have witnessed, are records alone open to him; we look over and contemplate the wonderful evidences, dim markings of the past, hieroglyphics from former creations,

"Way-marks of two eternities."

We may not find a more appropriate place than this to state that it has been in order to convey a clear idea of the great general law, that all planets born from condensing comets, begin their revolutions in remote paths around the sun, step by step assuming positions nearer and nearer to him, at last falling into his fires; — it was in order to set forth this law in a clear and comprehensive manner, that this volume has arranged the planets into what may appear to some an order of evolution too exact, precise, and strained.

We do not mean, absolutely, that the earth, in exact and definite epochs, has occupied the precise positions of, with contour measured exactly by, all the outer planets. But we do mean and it is one of the objects of this volume to elucidate, that the general law of the creation and evolution of all planets, is from the circumference to the center, from the outer confines of our system towards the sun, the final tomb, end, and resurrection of them all.

CHAPTER XXII.

BIBLICAL CRITICISM — EGYPT, INDIA — THE BOOK OF THE DEAD, THE VEDAS — ADAM THE NAME OF A RACE.

"Is not this written in the book of Jasher?"

Adam was the ancient name of a mighty human epoch, a race of people who made their advent on the earth, far back in the night of an immense antiquity; in whom first dawned human reason and the blending of such qualities —

"That nature could stand up and say
To all the world, This is a man."

The Adam of Jewish mythology, the symbolic and traditional father of his people, the Adam of the second chapter of Genesis, was not the first man, nor the first Adam; the first chapter of Genesis bluntly declares that he was not.[1]

[1] Adam was, it appears, a red man. Winchell tells us that "Adam" is derived from the red earth. The radical letters, ÂDâM are found in ADa MaH, "something out of which vegetation was made to germinate;" to wit, the earth. ÂDôM and ÂDOM signify red, ruddy, bay colored, as of a horse, the color of a red heifer; "ÂDâM, a man, a human being, male or female, red, ruddy." (Preadamites, page 161.)

"It appears" says Ramsey, in his "Preadamite Man," "that the term 'ha adam,' generally used in the pointed text, that in Hebrew the prefix 'ha' is equivalent to our 'the,' and is of course an article, while 'Adam' was a proper name, and a collective patronymic, like 'Israel,' 'Jacob,' 'Gideon,' 'Dan,' and 'Reuben.' Though in some sense the term 'Adam,' differs from the others, in as much as it was a generic epithet. 'Adam,' without the

A mighty race of Adam, a numerous tribe of Adam, a populous and powerful kingdom of Adam, inhabited this earth for nine hundred and thirty years, peopling the plains and multiplying on the continents; such a people had lived and died; acted out the panorama of their history, disappeared from the earth and been forgotten, ages prior to the second or Jewish Adam.

The second chapter of Genesis contains a symbolic story of the second Adam, while the first chapter of Genesis tells us that on the sixth day —

> "God created man; male and female created he them,
> And said unto them, Be fruitful and multiply,
> Subdue the earth; eat of the fruit of every tree."

At the close of the first chapter of Genesis — omit the three following chapters — and at the commencement of the fifth chapter, you will find the continuation of the same historic narrative, written in the same style, with the term "God" commencing every verse; while the intervening chapters are written in another style, with the term "Lord God" commencing every verse.

Taking up, therefore, the continued thread of the narrative, ending with the first, and beginning with the fifth chapter of Genesis, we read again, that —

article 'ha' was the name of the Hebrew protoplast, with the artiele 'ha,' the name of a race, or the whole human race."

Says a British author, "'Adam' was a generic epithet, a collective noun signifying 'The Adamites;' 'ha adam' is a vague singular, but virtually a plural. The Septuagint has 'ha-adamah,' which is probably the better rendering."

"'Adam,'" says the same author, "signifies 'redness,' 'red earth,' or 'red men.'"

Josephus also (book the first) says, "'Adam,' which in the Hebrew tongue signifies one that is red, because he was formed out of red earth, compounded together."

"God created man, male and female created he them,
And blessed them, and called *their* name Adam."

But when these people had existed as long as the American government, one hundred and thirty years, they began to establish colonies, begetting sons and daughters. The name of the first colony which sprung from Adam was Seth. Adam continued in existence for nine hundred and thirty years, when this mighty people, like Egypt, Greece, Rome, and numerous past nations of the earth, went out of existence. Seth, however, still prospered, and continued in existence nine hundred and twelve years. When Seth, however, was in his one hundred and fiftieth year, an emigration went out of him, founding the new kingdom of Enos, and all the days of Enos were nine hundred and five years.

In this manner pursues the record in its long chain of historic connection, of races, tribes, and *tongues* that followed each other in the long line of succession.

The oldest of all these ancient races was Methuselah, who lived to the great age, continuing in existence for nine hundred and sixty-nine years, perpetuating the same customs, and begetting sons and daughters; when like the history of all the races of the earth, this powerful people took its place in the oblivion of the past. This nation existed to an age and became older than the present government of China, older than hieroglyphical or monumental Egypt, older than imperial or republican Rome; and was without doubt the oldest government that ever existed on the face of the globe.

This record of races continues through two whole chapters, giving names of kingdoms and tongues, until we come down to the kingdom of Noah, which existed five hundred years.

Omit again the three following chapters, and continue the record of the generations of Noah, commencing with the tenth chapter of Genesis, beginning, "These are the generations of Noah." Every son, offspring, or tribe "after his *tongue*, after his family, in their lands and nations," and we soon come to Nimrod, a name which Egyptologists have deciphered for us, from the tombs of Egypt, and modern research proves to have been the name of the first great Babylon, a city of four million inhabitants, which had been a number of times depopulated and rebuilt, and was again sacked by Sargon, as related by Berosus, two thousand years before the Christian era.

In this chronology of fathers begetting sons, we read the names of Sodom and Gomorrah, and in the same chapter we find explained that these are sons "after their tongues, in their countries, and in their nations." Notice, also, that the word "tongues," signifying different languages, occurs repeatedly in this whole genealogy, which is supposed to represent a period of time long prior to the building of the tower of Babel; at the building of which, if we regard the account as pure history, and not as a symbol, the numerous languages had their origin; in which light it is open to the criticism that numerous tongues or languages had been spoken for long prior ages, as related in the preceding chapters; it must therefore be regarded separately as a symbol, and not as history.

At the close of the tenth chapter of Genesis, ending with Shem, omit the last verse, and commence with the eleventh verse of the next chapter and continue the thread of the chronology; and you have the pure ancient historic, and perhaps the symbolic, sacred Egyptian records, of the long train of tribes and nations of men that far

back in the past inhabited the earth; and here, in the eleventh chapter, commences the first migration of the Jews from Egypt, in the person of Abram and his followers.

It will become apparent hereafter that the portions of Genesis which we have omitted, containing symbols of science and history; in Eve's creation from a rib, the murder of Abel, Noah's ark, the tower of Babel, etc., which are written in styles totally unlike the first, with use of the term "Lord God" commencing every verse, while the simple word "God" commences each verse of the intervening chapters, are all of them symbols like "the days" of the first chapter of Genesis; they are symbols, locking up in terse, rounded statements, tremendous epochs, stupendous events, terrible catastrophes, and grand glories; here are also symbols of science and the laws of nature, ethics, and the relation man bears to his creator — volumes of what is known and what is not yet fathomed.

The book of Genesis is a compendium of not one but many authors; the dove-tailed parts, interlocking and joining each other, bear the stamps of not alone various originators, but various periods, or ages, in the past history of their origin.

That which calls forth our admiration of the Old Testament is the worlds of science, history, philosophy, and morality which leap out of its sentences, — out of its wondrous isolated parts, — grand utterances tied up and complete within themselves, like balls of yarn capable of infinite unfolding — jewels of truth, sparkling sometimes like diamonds amid rubbish, or like the stars of this upper sky in the darkest night of human blindness and sorrow.

The grandeur and sublimity of these shining gems of eternal truth, become more dazzling arrayed like lights against the dark wall of the unfathomable; the sublimity of the picture more apparent with its mysterious and unknowable background, with its various colors and sharp contrasted shadings; the great line of argument more overwhelming by sudden breaks where the light ebbs and flows.

The Old Testament may be said to represent the wisdom of antiquity and the sublime manifestation of that inspiration which has impelled all that is noble and true in human thought and human life.

It contains the accumulated religious utterances of a tremendous past; and the sublime symbols, metaphors, and axioms of science are often intermingled with songs, incantations, and histories of dark eras and peoples; who through God's providence have preserved and perpetuated them, the full import of which they could not comprehend.

The religious, scientific, and historic sayings and symbols of this book, or collection of books, — for it was not until after the Christian era that they were gathered and published together in one volume, — are older than has been conceived.

Like a rolling snow-ball, this volume of divine poetry, inspired philosophy, written law, histories, symbols, and worship of truth, has accumulated, and represents not alone the Jews, but before them Egypt, and before it, bronze and stone periods, — mighty ages prior to floods, convulsions, and the decay of continents.

It has rolled down through the ages of a tremendous past; beginning on the earliest shore of human aforetime; through high tides of civilization and low;

it has rolled through the histories and seen the decay of grand empires; and gone through the mire of barbarism, defacing its glory and leaving traces of mud. Marginal notes and other comments written by interpreters, commentators, and translators are so intermingled with its more sublime parts, that it is difficult, if not impossible, of analysis.

But it is full of gold and rare jewels, repeating in us the emotions of the past, when God has whispered to human hearts, or spoken aloud to mighty nations, his everlasting law.

Let us treasure this volume for what it claims for itself, that which it assumes to be, for what it is, regardless of those who, in the enthusiasm of their admiration, have exalted its every iota, word, and dot to heaven, and thereby made it a mark of the severest ridicule.

The Jews left Egypt with Egyptian education, having sprung in earlier times from a mixture of Hindoo and Asiatic stock, and when they left Egypt, under their leader Abram, they carried with them the remembrances of the religious teachings of their ancestors, the Vedas, and the sacred books of Egypt,— the sacred books of a people whose science and civilization, and the spirit utterances of whose religion, were the grandest the world has seen.[1]

Clemens of Alexandria tells us that the ancient Egyptians had forty-two sacred books, divided by them into various classes; one class consisted of songs and

[1] In like manner as ideas and observances of the more ancient oriental nations crop out in the Old Testament, so also, to-day, much of what is, by many, regarded as an essential part of the Christian religion has been borrowed from our ancesters, — the Druids. We retain still many of their customs, forms of worship, and their sacred Sunday, with numerous other un-

EGYPTIAN CATACOMBS AND PYRAMIDS.

psalms, another class treated of religious ceremonies; another class prescribed the duties of priests, and yet another gave laws for the people; still others treated of history, science, medicine, etc.; only one of these books, however, has been handed down to us; it consists of prayers, hymns, and ordinances, a copy of which was found by the French at Thebes.

The whole life of ancient Egypt took the stamp of religion; their writings were so full of religious symbols that it could scarcely be used for any other purposes; philosophy and science were merely branches of religion, and art labored only to glorify the gods; forms and ceremonies were numerous and imperative, and the details of every-day life were regulated by it.

The natural instinct and life of the Egyptian was to worship. A future life was his daily meditation; to him the sun seemed to die at its setting, and when it flamed its beams again in the forehead of the sky, it was the symbol of man's resurrection.

Their religious and other temples were more spacious and grand than anything in modern times, each of which had a presiding body of priests. The pyramids still in

conscious forms and ideas which existed among them prior to their conversion to the Christian Catholic religion.

All the ancient oriental nations, together with the Jews and the early Christians, designated the days of the week by simple numbers, the Jewish seventh day falling on the Druid Saturday.

Sunday, Monday, Tuesday, Wednesday, Thursday, Friday, and Saturday are old Druid days, derived from the names of Druid gods, naturally retained from our own ancestors.

When the Druid priests of England, Germany, France, Denmark, and all the eastern and northern nations began to embrace the Christian religion, they congregated for worship, as had been their custom, in their temples, on their old sacred day, — a day dedicated to the sun for sun worship, — Sunday.

their ruins are the marvel of mankind. The river Nile was diverted from its course to make a place for the city of Memphis. The artificial lake of Moeris, created as a reservoir, was four hundred and fifty miles in circumference, with subterranean channels, flood-gates, locks, and dams.

The temple of Karnak covered a square, each side of which is eighteen hundred feet. Travellers all appear to have been unable to find words to express the feelings with which these sublime remains inspired them ; courts, halls, gateways, pillars, obelisks, monolithic figures, sculptured sphinxes, are massed in such profusion that it is hardly possible to believe in the magnificence and grandeur of the ancient realities.

The cathedral of Notre Dame at Paris could be built inside a single one of the halls of Karnak, and not touch the walls. The whole valley of the Nile from the Catacombs to the sea, was covered with temples, palaces, tombs, pyramids, and pillars.

It is hardly possible for the mind to appreciate the grandeur of this ancient civilization ; yet when we consider that our own country is as yet but a little more than one hundred years old, and that according to all the authorities, civilization in Egypt covered a period of at least

Retaining their old sacred day as their new Sabbath, our ancestors through their representatives, the Druid priests, substituted, as rapidly as the old superstitions would admit, Christ and the new Christian religion.

For a long time, among the people there was a great intermixture and conflict of the old Druidic and the new Christian ideas.

The old symbol of the sun, represented by a hoop, was not easily substituted for the new symbol of the cross ; and the early priests, in compromise, allowed the intermixture and blending of the two symbols ; the old sacred hoop, — symbol of the sun — dear to the hearts of the people, — and the new cross, were, for a time, combined in one. The hoop was on one side,

ten thousand years, the mind recognizes at once something solid and eternal in the principles of their religion, of which its systems of government and sculptured edifices were but the outward manifestation.

The priesthood did not constitute an exclusive caste; in addition to their religious functions, they were judges of provinces, military commanders, and were divided into various grades, such as prophets, pontiffs, scribes, etc.

No country in the world paid women greater respect, or held them in higher esteem than Egypt. Monogamy was the rule; not even the kings in early days were allowed to have more than one wife. Her function was the ruling of her own household; here she taught her children morals, and imbued them with that religious sublimity characteristic of the whole people. The ceremony of marriage embraced an oath of promised chastity and purity.

In the temples flowers were placed upon the altars, and they were sometimes decorated with the various forms of vegetable life; and even the mineral kingdom was represented in their religious ceremonies, as so many varied symbols of the Divine.

sawed through, and the two detached ends were drawn past each other, forming the cross.

Even now, on Good Friday, this symbol is seen in the form of candles, doughnuts, and baked bread, in German and other shops.

It is the symbol of the compromise and blending of Druidism and Christianity, in which Christianity gave up the old sacred seventh day, and conceded the Druid Sunday.

This concession, however, of the major part of the Christian world, in which the old sacred seventh-day Sabbath was changed to the Druid Sunday, was reconciled, and made appropriate and consistent in the argument and belief, perhaps well grounded, that on this day of the week occurred Christ's resurrection.

Like the children of Israel, who, in a lesser degree, copied these ancient rites, they sometimes sacrificed animals, sprinkling the blood upon the altars, while incense was offered to the gods.

Until the coming of Swedenborg, says Dr. Clark, who gave his disciples the precise measure and form of the life to come, no religion has ever taught an immortality as distinct in its outline or as solid in its substance as that of the ancient Egyptians.

A king's tomb at Thebes gives us in a few words the religious creed of a Pharaoh : —

> "I lived in truth, and fed my soul with justice ;
> What I did was done in peace. I loved God,
> Gave bread to the hungry, water to the thirsty,
> Clothes to the naked, and a shelter
> To the stranger. I honored the gods
> With sacrifices, and the dead with offerings."

At Lycopolis numerous rocks contain ancient hieroglyphic inscriptions ; from one is deciphered the following : —

> "I never took the child from its mother's bosom,
> Nor the poor man from the side of his wife."

An inscription on a papyrus in the British Museum carefully interpreted, reads as follows : —

> "God has been with me through all the temptations of life ;
> His mind inspired my own in charity and virtue."

There are hundreds of such stones in Egypt, covered with inscriptions of a high moral and religious strain, everywhere proclaiming justice, mercy, benevolence, kindness, affection, and love ; reverence for the gods ; respect of man, and regard of woman. After ten thousand years,

will anything more sublime be deciphered from our tombstones?

From Clemens Alexandrinus we learn that the Egyptians had forty-two sacred books treating separately of poetry, songs and praise, ethics, morals, science, astronomy, hieroglyphics, geography, medicine, and topics as varied as the "Encyclopedia Britannica." A fragment of one of these books is still extant in two original copies on papyrus, one found by the French at Thebes, the other by Champallin in Turin.

Possessing these sacred treasures of Egypt's knowledge, Abram and his followers, with Moses and the children of Israel, leaving Egypt for a new and promised land, is it any wonder that the whole drift of their religion and literature should reflect Egypt, the sea and source of its inspiration?

The great peculiarity of the Egyptian religion, and that which has created astonishment, was the worship of special objects in nature, plants, animals, sun, moon, and stars. Animals were, in some mysterious sense, objects of their profound adoration; accordingly, we find them embalmed in tombs, and wrapped with delicate care; also plants, from which it has been inferred in the language of Murray, "Their gods grew in gardens."

Reverence for plants and animals was the natural outgrowth of their system of religion. Pantheists, as were the educated priests, and pantheistic as was the whole fabric of their philosophy, reverence and adoration for "the All," found expression in variety, and each individual part symbolized the whole.

The Egyptians regarded this universe as the outward manifestation of God. He was the sum total of things; and existed also in his fullness in the minutest atom — the

all — embracing unity ; and the varied phenomena of nature were but manifestations of the Divinity. Everything in a mysterious way symbolized Him ; plants and animals were the expression of his thoughts ; and there sprung up, accordingly, this peculiar worship. And it is possible that the people did not all comprehend the philosophy of the priesthood, — "unity in variety," — and losing sight of "the All," followed the outward forms and customs in the worship of objects, animals, plants, etc.

> "There 's something in that ancient superstition
> Which, erring as it is, our fancy loves ;
> The spring that with its thousand crystal bubbles,
> Bursts from the bosom of some desert rock,
> In secret solitude may well be deemed
> The haunt of something purer, more refined,
> And deeper, truer, mightier than ourselves."

Can we, to-day, view the surrounding hills and stars, oceans, plains, slopes, and flowers ; animals in countless variety, these embodied thoughts of God ; each meaning something, symbolizing something — without a feeling of reverence and awe? Every part of the religion of Egypt shows how much they were attracted towards variety, towards nature, towards the outward manifestations of the Divine ; this tendency reached its culmination in the worship of animals.

Forty-two commandments prescribe the duties of man to man, and gave the rewards of virtue.

We know that Genesis resembles older chronological accounts ; we know that the story of "the fall" was not original with the Hebrew nation, and that the legend existed in various forms before the reign of Menes in Egypt.

And when we call to mind the fact that Seth was God's primitive name in Asia, as was Shem, that of the sun, long before the founding of the first Egyptian empire; and that Enos is the Arabic word for "man" the same as Adamah or ha-adam in Hebrew, all meaning "the man" or "race of man," the allegorical nature of the whole chronology becomes clear.

The Egyptians had a story about the flood and ark ages before Abram; that the story in Genesis is but a symbol or modified copy of the old one, as is also that of creation, Adam, the fall, the ark, and the deluge, there can be no doubt. It is not hard to demonstrate the allegorical and typical character of much that we have been accepting as absolutely true and exact in both profane and sacred history.

The Babylonians and Chaldeans had an Adam-Kadma, or first man, and they had also ten epochs from creation to the flood, just as the Hebrew story has ten generations from Adam to Noah.

The first epoch to the Chaldean historian was that of Alorus, and extended to the beginning of the second epoch. Hippolytus tells us that the Chaldeans called the early races of men born of the earth, but who afterwards became living souls, Adam.

Beyond all reasonable doubt, "Moses, who was learned in all the learning of the Egyptians," knew their theories of the human origin. Long before his cradle was found in the bulrushes of Rhodes by the king's daughter of royal Memphis; long before the Hebrew lawgiver had listened to the promptings of ambition, old Chaldea's poets had sung of a "time in which nothing rested but black darkness, and an abyss deep of waters," which fragment differs but little from the second verse of

Genesis. There is every reason to believe that the latter was not written till thousands of years after the former had been crystallized into the faith of an entire family of nations, dwelling in cities, scattered thickly over eastern Asia, and along the banks of the Euphrates.

It is generally admitted by biblical scholars, that the first verse of Genesis is a preface to what follows, and that the first chapter properly ends at the fourth verse of the second chapter, which embraces one narrative of man's creation; while the balance of the second chapter contains a totally different account, a chapter of symbols obtained from another source.

Long before Menes founded Memphis, the Phenician sages had taught of a —

> "Turbid chaos, and black as starless night,
> Over which swept breezes of thickened air;"

and the early people of India were familiar with the cosmogonic phraseology. Indeed, the same sublime conception that has been handed down to us in Genesis, constituted the starting-point of a number of oriental theories of creation.

The discoveries recently being made concerning the books of antiquity, and also in reference to both the Old and the New Testament, are rapidly but surely destroying the letter, but preserving the spirit and soul, dispersing the clouds that envelope Jesus and the past, and fixing him and his imperial truths in flames of shining light, so that all can see their glowing beauties, and every thirsty soul drink at the fountains of living water.

It was in Egypt that Jesus spent the greater part of his boyhood and probably his early manhood, receiving and reflecting divine wisdom, coming down from the antiquities.

O sacred people! your monuments still lift their heads to heaven, and the wellspring of your oracles, with the inspired utterances of your philosophy, still leavens the civilizations of the world, still flows in human history and in human hearts!

Herodotus tells us that the word "Palistu" is written on a monument in Karnak in Egypt, and is also found in Nineveh; this is undoubtedly the origin of the word "Philistine," or "Palistine," and gives us the key to the origin and migration of the Jews.[1]

Moses is purely an Egyptian name; he was reared by the daughter of Pharaoh in the household of a king; was himself an Egyptian priest, which capacity he filled until the age of forty-three, the student and teacher of Egypt's education,—when among its monuments clustered the grandest art and science in the history of the world.

It was to Egypt that Greek and Roman scholars went for instruction; here Pythagoras, Herodotus, and Plato caught the spirit of their profound philosophy, and became imbued with the religious sublimity which made the monuments of their lives, and through which these men shine out from the night of Greece, like beacon lights from the darkness of that era of philosophic infidelity and selfishness.

Moses knew all that Egypt could teach, and he perpetuated the old Egyptian rites and ceremonies. We must therefore look for the well-spring of that great divinity which underlies the Old Testament, breathing in its philosophy, its oracles, its poetry, back to a time earlier than has been conceived.

[1] In the ancient history of Hindostan we find also a branch called "Filistines."

During the wanderings of the Jews in the wilderness, and we might add, the general down-fall and corruption of this people, it was natural for them to create arguments for the justification of their acts; and amid the sublime sayings of their patriarchs and prophets, we see cropping out even a defense for their crimes; yes, like Mohammedanism, wholesale human massacres were perpetuated by devilish inspirations as they affirm from God.

The Jews came to believe that they were created by an especial fiat of God, that they were his chosen people, and that all other races of men had sprung from their outcasts; hence the story of the vagabond Cain, who fled to another country, finally getting married, settling down, and founding a city,—a story which, if taken in the strict letter of its wording, becomes contradictory, untenable, and absurd; if regarded, however, among symbols, as a symbol, we shall yet show that it flashes forth a meaning of the deepest import.

This story is contained, however, in the Hindoo Vedas; which, by the way, is, without doubt, the original religious book of the Jews, prior to the time when taken from Asia or Hindostan into Egypt, as slaves; and by a long course of generations amalgamated with Egyptian stock. And it is reasonable to suppose that although reared and educated in Egypt, they still adhered, in a considerable measure, to the teachings of their ancestors; hence the many sayings in the Bible seemingly borrowed from the Hindoo Vedas.

Let it not be supposed, however, that the ancient Hindoo Vedas is a heathen book; well might modern nations study the ancient literature of this once mighty people, and pattern after her civilization, as indicated in

the sublime precepts of this ancient Vedas; also in the ruins of her sculptured cities, sometimes rivaling, if not surpassing, the stupendous works of Egypt.

Indeed, were it not for the fact that extensive ruins still exist in Hindostan and other India, the accounts of others which have disappeared, having succumbed to the ravages of time and the fury of the bigoted Mussulman, would sound, in our ears, as incredible as the story of "Parnassu's tomb, which o'ertopped old Pelian, and made Ossa like a wart."

"On the banks of the Ganges stand to-day the ruins of the ancient city Benares. The great temple Bendh Madhu was demolished in the seventeenth century. The body of this magnificent temple was constructed in the figure of a colossal cross, with a lofty dome at the center, above which rose a massive structure; at the four extremities of the cross there were other temples, of proportionate dimensions."

Similar ruins are found on the banks of the Jura, including the subterranean temple at Elephanta, whose sculptured halls and columns in all their massive proportions and grandeur, were hewn from solid rock. Maurice describes at length the massive ruins and still standing columns of the mighty Indian cities which point back to their once high civilization.

Is it not worth our time to examine the sacred books of this once great people? for it cannot be questioned that many of the sayings of the Old Testament are but verbatim copies from the Vedas.

Among its precepts, science, philosophy, and poetry we find a sublimity only equaled by the Old Testament itself.

From this Vedas we select the following sentences, which will serve to illustrate the general character of this ancient Hindoo bible: —

"As the earth yields its fruit to those who rend
Its bosom with a plow, so return good for evil."

"Consider the supreme omniscient Intelligence,
The sovereign Lord of the universe, by whom
Alone it exists; an incomprehensible Spirit
Pervading all beings, and causing them to pass
Through birth and death like the wheels of a car."

"The fruit of every virtuous act which thou hast done,
O good man, since thy birth, shall depart from thee
To the dogs, if thou deviate from the truth."

"The man who perceives in himself the Supreme soul,
Present in all creatures, acquires equanimity
Towards them all, and shall be absolved
At last into the essence of the Almighty."

"A true and faithful wife who wishes to attain
In heaven the measure of her husband, must do
Nothing unjust to him, or unkind to others."

"Forgive injuries. Never neglect your duty;
Be liberal. Let your meditations be pure,
And purge yourselves from secret, sinful thoughts."

The Vedas is overflowing with sentences of the loftiest import, which we have not space further to examine.

From these grand sources, Egypt and India, came the hereditary education, as well as the blood and sinew itself, of the Jews. They combined these influences in the formation of a religious tendency, while slaves in Egypt.

From India and Egypt as the hereditary cradle and school of Abraham, Moses, and the Jews, came that lofty inspiration which after they had left Egypt while wandering in the wilderness, culminated in the Old Testament.

From Egypt and India came their code of law, their tabernacles and their sacrifices, their circumcisions and

their commandments, their symbols of the creation, their traditions of men and races, their legends of floods, of Edenic gardens, the flaming sword, and fall of man.

And in this we find the explanation of older utterances, embodied in the Old Testament, handed down to us from crumbling nations and forgotten peoples, preserved from sinking continents, floods, and fires, coming down from the very threshold of the human era.

The truths of the Old Testament,—the divine inspirations to the children of men in all the ages of the mighty past,—together with the psalms and songs of the Jewish patriarchs and prophets, are not hurt nor soiled, though mixed and mingled with the ecstatic utterances of men, which not even the subservient authors from higher powers, in the depth and degree of their inspirations, could distinguish from that which emanated from puerile human faculties.

The sublime inspirations from higher intelligences, through the Jewish patriarchs and prophets, retard not the glory of their shining, even though interwoven with the full profane history of the Jews, in its dark burden of wars, its aggregated load of vice and crime, wherein kings and princes have defended wholesale massacres, pluralities of wives, harems of concubines, human slavery, and the foulest and blackest crimes.

The truths of this sublime Bible stand the test of all the ages, and become grander in the light of science; while many of its sayings when construed literally are so seemingly the product of erring human faculties, of barbaric invention, that Voltaires, Paines, and Ingersolls keep their audiences laughing at the absurdity of talking animals, snakes manufactured from canes, the stomach of whales transformed into palace-cars, and the supreme God of this universe sitting in the cool of shade trees,—

such is the natural outgrowth of the "plenary inspiration theory" to those who cannot understand the use of metaphors, comparisons, illustrations, symbols, allegories, and the word paintings and poetry of human language, when dealing with subjects beyond the dictionary of human terms, and the easy comprehension of finite thought.

Construed as a story in its literal sense, is it a wonder that infidels have said, "That little ark would not hold hay enough to feed the elephants"? but taking the account as a symbol, it locks up in a few sentences the whole history of the deluge, in a way that even heathen ages have repeated and perpetuated the story,—a story so constructed that it stands the test of enlightened science, symbolizing the most terrible event the earth has seen, with the ark of safety for the escaping few,—a symbol worthy of an inspired hand.

So also of the story of the building of the tower of Babel and the confounding of tongues; if considered as exact history, it is open to the criticism that the person who wrote it and put it into the eleventh chapter of Genesis, did not even stop to read the chapter, else he would have put it in sooner, or torn out the preceding sentences in which the word "tongues" repeatedly occurs, and in which we are told of Adam, Noah, etc.: these are generations of sons and daughters, not in the sense of single persons, but —

> "After their tongues, in their
> Lands, and in their nations."

When we regard the story of the building of the tower of Babel with its confounding of tongues as a symbol of the building of all ancient pyramids and the derivation of all languages, it becomes grand in the ex-

A People of Forty Thousand Years Ago, Building the Pyramids of Mexico.

treme. So also of the names "Adam," "Cain," "Abel," "Methuselah," "Noah," etc.—symbols meaning tribes, races, or nations, "after their tongues, in their lands, and in their nations."

Had we the complete, sacred, ancient Egyptian and Hindoo records, we would have a history of the great flood, concerning which the priests of Egypt told Solon, the learned Greek, three hundred years before the Christian era; a full account of which they said was in their records, concerning the continent of Atlantis, sunk in the Atlantic Ocean, with islands larger than and as densely populated as Great Britain.

Ships sent out by the American and English governments have dragged the Atlantic Ocean, and found evidence to verify what had been regarded as Grecian fables, concerning Egyptian records that described great and powerful continents, which in early times existed in the East, and which were lost forever in a terrible flood.

Donnelly attempts to prove in his "Atlantis" that these sunken islands distributed the colonies of Egypt, China, Mexico, and early Britain, and thus explains the sameness of monuments, hieroglyphics, and bronze implements, preserved from the antiquities of these countries.

We read that Noah begat sons and daughters (probably a symbol of the colonies that went out from the fatherland), and that in his five hundredth year, there came a disastrous flood.

But the records which the Egyptians had preserved from the earliest times were modified, condensed, and crystallized by the Jews into symbols; therefore in Genesis we have rounded stories,—almost single sentences,—standing in the place of forgotten volumes.

Instead of lengthy and elaborate histories relating how certain nations escaped the ingulfing maelstrom,

thereby perpetuating tongues and tribes, we have it all in the condensed symbol of Noah and the ark. And in the place of a long, labored history pertaining to the builders of the various ancient mounds and pyramids of the earth, we have it all condensed in the symbol of the building of the tower of Babel and the confounding of tongues. In the nineteenth chapter of this book we have likewise symbolized the whole history of the planet Mars, with an Adamah and ark.

The simplified symbols of the Old Testament to-day stand out as the embodiment of great historic, scientific, and moral truths, becoming more grand under the test of modern research and the lamp of the nineteenth-century science.

The same divinity that was in the chaos of the early creation, and moved onward by slow steps to the order and beauty of our system, has been in the chaos of the material evolving symbols from the libraries of long forgotten ages, in the unconscious writings of patriarchs and prophets, producing the wonderful pages of the Bible. These earlier, ancient, lost libraries, from which the Jewish patriarchs and prophets drank wisdom, are referred to, by them, in various ways, "As it is written;" "It is written;" "Is not this written in the book of the wars of the Lord?" "As it is written in the book of Jasher," etc.

Let us, in profound reverence, build comparative symbols from pagan history.

In the beginning God created man, and called his name Egypt; and these are the generations of Egypt, after their tongues, in their lands and nations, in the day that God created him; male and female created he them.

And Egypt knew his wife; and she conceived and bare Phenicia, Etruria, and Greece; and the days of

Egypt after he begat Greece, were sixteen hundred years; and all the days of Egypt were ten thousand years; and he died.

And Greece begat Persia and Rome; and when Greece was seven hundred years old, he died.

And Rome begat Britain, Austria, and France; and Rome lived three hundred years after he begat Britain; and all the days of Rome were eight hundred and ninety-nine years, and he died.

Britain begat America, France begat Canada, and Austria slew his brother Poland.

Similar symbols, constituting Genesis, we have of the ancient world; of times and things prior to the flood. There is a world of condensed, crystallized meaning, in its every word. Symbols representing volumes of unwritten history, science, philosophy, and law.

We have found the key which has unlocked the meaning of numerous symbols pertaining to the creation.

"Days"—symbols of immeasurable ages, epochs of stupendous changes, "way-marks" of that eternity which evolved the world from chaos.

"Adam," "Seth," "Enos," "Methuselah," "Noah," "Shem," "Ham," etc., are all symbols, meaning epochs of the human family, nations, multitudes, races, tongues.

Plants and animals "created before they grew," is a symbol of the Divine plan, tied up in the cosmos of the dawning creation, prior to the sun.

The birth of Eve from "Adam's rib" is a symbol of the Divine plan, of the reproduction and propagation of all life.

"The serpent and forbidden tree" is a symbol of the temptations, vice, and crime in the human family.

The slaying of Abel by his brother Cain is a symbol of the map and record of all the wars.

The ark of Noah is a symbol of the earth's axial changes; and the escape of parts of the world from the flood, when Atlantis sunk beneath the sea.

"The tower of Babel" is a symbol of the building of the pyramids, of all the ruins of the past, and the derivation of all languages.

"The flaming sword" is a symbol of all comets; and the comet in particular which destroyed the Edenic world.

"The seed of the woman bruising the serpent's head" is a symbol of the Christian religion, and a millennium of righteousness yet to come.

There is tied up, here, in the Old Testament, "books which the world itself could not contain;" every sentence is an encyclopedia, every word a stupendous volume.

The divine mind of man will yet learn to read its wonderful import, and drink wisdom and righteousness from the inexhaustible fountain.

Explain to me, infidels, who deny providence, the wonders tied up in these ancient sentences. I call upon you, Voltaire, Paine, and Ingersoll, to explain to me how the ancients gave utterance to such wonderful thought and science, and how and why, at various periods of the world, savages have preserved and perpetuated them. Should you ask me for an explanation, I should reply, in the language of others,

> "Human nature rests on a greater reality;
> In God we live, move, and have our being;
> There is a spirit in man, and the inspiration
> Of the Almighty giveth them understanding."

The sublime truths of the Bible; its music and its poetry, its psalms and songs, are the songs and psalms which the spheres still sing. Its written oracles are a re-

flection from the oracles written on the stars; and the utterances, penned in its sublime sentences, are still echoed from the great heart of humanity.

I do not wish to be understood, from anything in this chapter pertaining to periods of superstition, through which the sayings of the Bible have rolled, as desiring to reject books, or any portion of these books, modified as they have been. A providence has mixed these symbols and sublime sayings with shadow, and made them grand by contrast.

The first impulse of the admirer is to tear away the snakes from Michael Angelo's painted beauty; but what power of sublimity, the mixture of darkness may give to the Bible, I know not.

The stars shine only in the night; light flashes forth brilliancy alone in darkness; man is yet too puny to fathom the mysteries of Providence. What suns and symbols may yet leap forth from the now unmeaning portions of the Bible, time alone can tell.

Let it stand in one bound volume, the monument of wonder, the stimulus to study, the leaven of all human development.

> Prophets have been among us; hands that penned
> And tongues that uttered wisdom, Isaiah, Job,
> Samuel, Ezekiel, Daniel, David;
> Great moralists, to act and comprehend;
> They knew how genuine glory was put on
> Through worship and close commune with God
> Foreshadowed enlightment and all our splendor;
> Our time, 't is strange, hath brought forth none such.
> Perpetual emptiness! unceasing change!
> No single volume paramount, no code,
> No master spirits, of law and prophecy;
> But equally a want of books and men!

CHAPTER XXIII.

CRITICISM OF HISTORY — AGE OF LETTERS — MORNING OF HUMANITY'S MANHOOD — FORTY THOUSAND YEARS.

The Chinese records tell of events that occurred among their ancestors one hundred and twenty-nine thousand years ago; their records of government, still preserved in their libraries, cover a period of eight thousand years; and they claim to possess fragmentary records of government sixty-three thousand years old. A Chinese work, written two thousand years before Christ, deals with the antiquities, and advocates the adoption of the ancient systems of education.

Whatever reply we make to these strange statements, one fact is certain, that China has sat, with her five hundred millions of people, within her two hundred million square miles of territory, in her cities, her monuments, her arts and sciences, the serene spectator of the birth and death of Greece; she has seen the beginning and crumbling of both imperial and republican Rome; she has seen dynasties, kingdoms, republics, revolutions; she has laughed as nations have come and gone, like bubbles bursting in air; she has looked on at the surging sea of wars, and the shifting map of humanity.

She has seen a modern Christ, coming in the night of a modern Jerusalem, radiant with glory, and profound with divine philosophy, standing in Galilee and teaching

the same sublime doctrine respecting man's duty to man that her Confucius had taught eight hundred years before.

She looked on as a modern Moses ascended the steeps of Mount Sinai, enshrouded in clouds and darkness, and caught from the secret hand of divine inspiration a plate of commandments, deep graven in stone; the same in number, and in the same identical phraseology, written on all her altars, and breathed from the antiquity of her religion. There lies back of us, in the mighty shadows of past races of men, not alone a great antiquity, but a great Divinity.

The Persians in their "Old Avesta," or "Twenty-one Nosks," tell us such strange and earnest stories that we are compelled to listen if not believe; these ancient books are certainly older than the writings of Moses; with them time has been divided into great circles, in which there has existed a class of progressive beings. These books give a history of tribes and races, covering a period of hundreds of thousands of years.

In Japan we hear things even more astounding; their annals give detailed records of a line of kings reaching back seventeen thousand years; they place the hypothetical origin of man at a period three hundred thousand years ago.

In Hindostan time is divided by great circles, the last of which is called the "Satya Yug," which is now elapsing: at its commencement lived one of their ancestors hundreds of thousands of years ago.

The Buddhistic circle of chronology, according to the sacred books of the mendicants' order, is called a "Sankya;" the square of which is called an "Anta Kalpa," representing a period of time reaching into the infinite past; at the beginning of which, we are told,

the first Buddha began to preach. To-day there are millions on this earth who believe these whole chronological systems.

Said Ali Mustapha, a Moslem, to me: "You laugh at our Kurds, and tell us impossible stories of five hundred distinct races of men, springing from a single pair, six thousand years ago; this is too absurd for reasoning contemplation. The one hundred and twelfth chapter of the Koran tells us that God never begat nor was begotten. I do not know, but I feel that God is a being too vast for human contemplation. I believe that this earth has been, for hundreds of thousands of years, the scene of human activities; I believe that time has moved in circles, each producing an ascending order of beings; we are but the initial type of glorious races yet to come. You and myself were present when I translated for you the sublime cosmogonies of Syria; they spoke of five ages before the present order of men; these five ages of fanciful beings are the recollections of human aforetime, stretching back into the dim vista of your geologic ages. Men, and races of men, move like the seasons, in circles; and each round of ages is but a repetition on a grander scale. Look at yonder moon; it rises, fulls, comes up, and goes down again; so man and nations; they rise, have a period of advance, reach a perihelion splendor, and then a night, and then a new day. But come, let us light our pipes; philosophy is tiresome."

The Hindoos have astronomical records, giving dates of conjunctions and eclipses of the sun and moon which occurred thirty thousand years ago. Nor can these facts be explained on the theory of back reckonings; they have had no motive to invent falsehoods for posterity; nor could they, if they would. Hindostan, like China,

ANCIENT HINDOO CALCULATING THE CONJUNCTIONS. [293]

is old with years, and but the shadow of that civilization and science which once were theirs.

Thus it is that the traditional and religious weight of evidence gives to man a vast antiquity.

The name of the first dynasty of Babylon was Nimrod. Berossos gives the names of eighty-seven kings of a still later dynasty, at the close of which time Babylon was sacked by Sargon, two thousand two hundred and eighty-four years before Christ; this is the data which has been assigned, by Bible commentators, to the beginning of Babylon; multiply this data by ten, and you will hardly have reached the beginning of that stupendous human hive.

Babylon was a city of four million inhabitants, occupying the space of two hundred square miles, or nearly five times the size of the present city of London. She was the great center of a belt of nations; and cities, connected with her in commerce, were strewn over the table-lands of Asia — cities and nations that have fallen into forgetfulness, buried in sands or washed by present seas.

The monuments of Egypt, the oldest of which are the pyramids,— wonders even in Egypt,— have left no representative behind them; there they stand, the silent orators of dead ages; as said the great Napoleon to his army, "looking down from unknown centuries."

The people who built the obelisks in Egypt, and covered them with hieroglyphics; who wrapped the mummies, embalming them with the greatest care, knew no more about the pyramid builders than we do to-day.

These majestic, voiceless sentinels,— the pyramids,— with heads uncovered, lifted heavenward, viewing the ages, stood there on the broad plain, with no spokesman to introduce their names, explain their origin, or tell their

motives; there they stood silent and dumb, when Egyptian civilization began; and not until recently has science deciphered for them a story.

Admitting that modern research is deciphering the story of "Cheops" and "Cephron,"

"Who reared to heaven their giant sepulchers,"

who shall touch the wand of science, and compel the giant mound of Ohio, lately discovered to be a broken and partially-crumbled pyramid, upon which mountain the grasses have trespassed and foliage waves? or who shall tell the story of the giant pyramid which rears its lofty form from the dismal cypress swamp of Florida? or who shall compel the pyramids of Mexico and Central America to give us back the history of races and tongues, whose only evidence are the crumbled rocks of their ancient tombs?

The rock sides of the deep gorges and high canyons of the Colorado valleys are literally cut full of dwellings of some ancient people. The Mancos River flows through a veritable city of ruins, and all the diverging canyons are honeycombed with rooms and halls, chiseled out of the solid granite, connected by entrance ways, and leading to central amphitheaters. Time and the elements have defaced the symmetrical beauty and polish, leaving only the architectural outlines of these ancient edifices, majestic still in their ruins. Here in these halls and rock amphitheaters, standing on the débris of ages, beneath which is entombed to-day their skulls and skeletons, with trophies of their handiwork, one can almost hear the orotund voices of orators, speaking in a language dead and lost, of the antiquities,— of the tremendous chasms of time that have rolled into the ages, since they were.

And what shall we say of the ruins of ancient public roads in Peru, some of them two thousand miles long, cut through hills, and made so thoroughly as to elicit the astonishment of the Spaniards? Humboldt pronounced them among the most stupendous works ever executed by man. One of these ancient roads is located fifty miles northwest of Magdelena. It consists of solid masonry, winding around and terracing a mountain two thousand feet high, portions of the rock sides of the mountain having been hewed down to form the road. At the base of the mountain is a hewn rock, weighing two hundred tons, placed at the mouth of what appears to be a hidden entrance, perhaps leading to the shrine of the ancient vestal virgin who kept eternal watch on the sacred fire which was never suffered to die.

There are in Mexico to-day the ruins of their ancient magnificent bridges, of hewn stone, with suspended gateways. Pyramids are found almost everywhere in Mexico; Cortez states that he counted four hundred of them at Cholula, one of which is over two hundred feet high, and covers an area of eleven acres; while scattered surrounding ruins are covered with hieroglyphics, similar in kind to those of ancient Egypt.

From the ancient Egyptian "Book of the Dead," wrested from the grasp of entombed mummies, which science has learned to read, Bunson establishes clearly that civilization in Egypt covered a period of thirty thousand years.[1]

[1] For confirmation of the data of this chapter, see "Prehistoric Man," "Preadamites," "Clark's Religions;" "Herodotus' Egypt;" Fossils of the British Museum; Smithsonian reports; "Genesis of Man;" Volney's "Ruins;" Egyptian records; Müller's "Chips;" Donnelly's "Atlantis;" "The Papal Voe;" "The Bible in India;" "Rise and Fall of Rome;"

And what means the symbol of a cross scattered everywhere in the ruins of this ancient Egyptian art? Wherefore come the pictures and sculptured stone statuary of a man nailed upon a cross, a crown of thorns upon his head, and a reed in his hand?

Explain to me, you churches of a new-found, modern god, the import and meaning of these symbols reflected out from the night of the oldest antiquity?

Should you ask me for an explanation, I should reply that man is not the author of his own existence; we rest on a greater reality.

"In God we live, move, and have our being;"

and the march of history is the shadow of divinity. His hand has molded all the ages. The voice of his children, in mighty millions, crying to him in darkness and ignorance, in mystic symbols and rude carvings of stone gods, clashing metals, beating drums, and loud ringing orgies; around fetish fires or curling smoke of sacrifice, in unfathomed desires, in the secret breathings of wishes, in unuttered prayers for light, has found responses in the all-pervading soul of things; and God has sent to the ages prophets. He has repeated himself in history; he has filled the vacuum, according to his eternal principles of justice and mercy.

Even as man was prophesied in the whole order of progressive beings, ascending step by step through the geologic ages, approaching nearer and nearer to him in

Murray's "Mythologies;" "Prehistoric Nations;" Ancient history; Humboldt's "Cosmos;" "Ancient America;" Josephus; Lewie's "History of Philosophy;" Bancroft; Prescott; Borosus; Gibbon; Tacitus; Renan; Strous; "Encyclopedia Britannica," and Appleton's and Chambers's encyclopedias.

contour, until he himself appeared, so Christ was prophesied through all the ages and epochs of human history, profane as well as sacred. And the omens and shadows become plainer and clearer in each advancing age, until his advent makes the mysterious forebodings intelligible.

The following is an extract, inserted from memory,[1] as translated from some ancient Latin work, when a student in Harvard College, representing a scene enacted in Athens five hundred years before the Christian era, in which the hero, nailed to a cross, gives utterance to the following, his dying language: —

> "See what, a god, I suffer from the gods! For mercy
> To mankind, I am not deemed worthy of mercy,
> But in this uncouth appointment am fixed here
> A spectacle dishonorable to Jove. On the throne
> Of Heaven scarce was he seated, then on its varied
> Powers he showered his beneficence; but for unhappy
> Mortals had no regard, and all the present race
> Doomed to extirpate and form anew. None dared
> Oppose his will; I dared, and nobly pleading,
> Saved them from destruction. Saved them from sinking
> To the realms of night, for which offense I bow
> Beneath these chains, dreadful to suffer, piteous to behold."

When Solon, the learned Greek, was at Sais in Egypt, the Egyptian priests told him they could show

[1] The quotations of this book, both poetry and Biblical, are invariably inserted from memory. The author has, however, looked up and verified Bible quotations. It may interest some to know that the author can repeat verbatim the whole of Milton's "Paradise Lost," Young's "Night Thoughts" and his "Judgment Day," Pope's "Essay on Man," Goldsmith's "Deserted Village," Longfellow's "Hiawatha," together with numerous other poems from the same authors, and extensive portions from Homer, Virgil, Tasso, Dante, Byron, Moore, Shakespeare, Tennyson, Cowper, Shelly, Tupper, Bryant, and numerous other poets. The author still treasures a Bible about four inches square which might have cost fifty cents, presented to him when a boy, as a reward for repeating, verbatim, the entire New Testament.

authentic names of his ancestors who lived nine thousand years before that date; this conversation occurred six hundred and nineteen years before Christ.

The priests of Egypt not only told Solon that their sacred books contained a record of their own country for eight thousand years, but also of Greece. They told him of a disastrous flood which had at one time swept the entire land of Greece, in which catastrophe whole continents were completely destroyed.

We will here quote verbatim from Plato's "Dialogues," in the words of the Egyptian priests, as related by and addressing the Greek Solon: "Our records state that your country [Greece] once checked the advance of a mighty power which threatened all Europe and Asia, bursting in upon them from the East; for at that time, beyond the pillars of Hercules there were islands larger than Liberia and Asia put together; and on these islands a powerful kingdom, which attempted to subjugate your country, O Greek, and ours. Then your country rose up, drove back the aggressors, and erected columns to commemorate the victory; but mighty earthquakes followed in one fatal night, and sunk your great army, with the entire isles of the Atlantis into the sea." "Timæus," Vol. 2, p. 517.

It is a fact that the traditions and religions of each and all races of mankind, savage and civilized, point back to a deluge, or great catastrophe, which befell this earth, in times so remote that I dare not attempt even an approximate guess in figures; I have reached the conclusion that once upon a time there occurred a tremendous event in the history of the inhabited globe; that the earth reached the intensity of an impossible ellipse, lost her axial balance, and formed new centers of motion.

Job understood, thoroughly, the philosophy of the event; his own kingdom was in part destroyed, and the colonies he had planted sunk into the sea; buildings crumbled over the heads of their inmates, and fire fell from heaven. Job describes this event in the following language: —

> "He causeth a mighty wind to blow,
> He treadeth upon the waves of the sea,
> He overturneth mountains in his anger,
> He shaketh the earth out of her place."

The climatic conditions of his country were changed, and the remnant of his people no longer prospered; thousands died of famine, fever, and boils. The atmospheric changes were so radical that vegetable, as well as animal, life, was affected by it.

> "He taketh away the hedge from the house."

After a time, however, the remnant became acclimated, and Job again began to prosper.

The glacial epoch followed in North America; centrifugal force hurried the waters from the old equator to the new, and unbalanced the internal fires; and earthquakes rent the yielding crust of the earth to and fro; many of the old continents sunk into the ocean, to rise no more; the great Atlantic continent was buried beneath the sea; civilization and cities went out in a night; the great Saharan lake of Africa, was drained; the American continent, with its broad load of arctic ice, was in part upheaved; the British Isles riven from Continental Europe; the region of the Atlas and of the Soudan cast up from briny depths; Japan was torn from China, and the Greek archipelago brought into being; Greenland, Siberia,

and the present Arctic Circle, with its tropical vegetation and tropical mastodons, were overtaken in the blast of a sudden winter, and stiffening into ice, have been preserved until this day.

Men and animals in countless millions perished on the earth, and all nature wore a new aspect. Those alone escaped who occupied favorable localities, where crossed the old and the new temperate and tropical belts; here on high table-lands, above the surging tidal waves, life was preserved in spite of the terrible earthquake and flood.

Prior to the great catastrophe, Salt Lake, in the State of Utah, was at the north pole of the earth, and the United States of America were then in the ice-covered arctic regions. The old north temperate belt encircled nearly the continent of North America, commencing in Bolivia and Mexico across the continents now sunk in the Atlantic Ocean, through Europe, Northern Siberia, Greenland, the present arctic regions, and Alaska, through the Pacific Ocean to the place of its beginning.

The old equator encircled the earth from a point commencing in the south of South America, through Africa, Asia, Russia, Western Siberia, through the Pacific Ocean to the place of its beginning.

Egypt, China, Hindostan, and the present south antarctic regions, were before the flood in the south temperate zone, near the equator. It is probable that the torrid zone, and the earth, as a whole, were cooler then than now, the earth at that time pursuing a circle more remote from the sun than at present; and it appears, from Cyclopean and other ancient ruins in South America and other parts of the world, that the highest civilizations were almost all in, or near, the old torrid zone.

WHEN CHEOPS AND CEPHRON REARED TO HEAVEN THEIR GIANT SEPULCHERS. [303]

The old south pole and south Antarctic Circle were in the Oceanic Islands.

Australia and North America are continents, therefore, to recover comparatively recently, from an arctic, ice, or glacial period, and from the evaporating or receding salt seas. Our broad prairies and young forests, with a surface stratum full of the petrified remains of sea-shells and fishes ; with salt beds and alkaline plains, precipitated from salt water by the process of freezing, point back to recent salt seas which covered these continents, and the early overlying strata of ice.

With the sudden change in the polar position and axial motion of the earth, the earth assumed a position nearer the sun, which now shines down with a new vitalizing power, calling forth a higher civilization, and developing in the brain and heart of man grander, purer faculties.

Thus with the play of elements, the wreck of continents, the ebb and flow of civilizations and of nations, is it any wonder that the early history of our race is shrouded in obscurity ? that the early race of Adam, which the first and fifth chapters of Genesis tell us plainly, constituted a mighty people, which inhabited the globe for nine hundred and thirty years, far back in the night of an immense antiquity,— that even the import of the records, handed down to us through the people of the pyramids, has been mistaken and forgotten, and dark ages of ignorance transformed the history of this ancient race into a man Adam, and created for him, in times of yesterday, a companion from a rib ?

There is an antiquity which had grown gray and venerable before antiquity began. There are monuments and

symbols of man's handiwork upon which history and tradition pour darkness instead of light.

Science alone can give us back the story of the long forgotten past; she has dug up the history of Herculaneum and Pompeii, and she is now digging out of the ocean the story of lost continents, peopled with human millions, over which the surging sea ebbs and flows.

History is distinct and clear through certain epochs; but history has no means of connecting those epochs; ancient Egypt, Greece, and Rome each stand isolated and distinct, with new methods of reckoning time. History can read their stories, but when they were, she cannot tell: great gulfs of the unknown separate these ages of antiquity; possibly of ignorance, perhaps of desolation; and not impossible that great gulfs of sea-water lashed their tidal waves for intervening ages. There must have been time and adequate causes for forgetfulness.

Babylonian, Egyptian, and Ninevite researches, through Bunsen, Layard, Muller, Shelling, Humboldt, Nelson, and others, have demonstrated the total unreliability of so-called ancient history and Jewish chronology.

We find that in Egypt, in India, and in Babylon a high degree not only of civilization but of learning and luxury, existed many thousand years ago.

All things advance from imperfection towards the perfect; but the rate of progress is necessarily slow. Nations, languages, science, art, and intellectual systems do not spring up in a night, but are of slow growth. Nations are like men; they are born, reach maturity, and grow old. The process, where a nation springs out of barbaric or savage conditions, requires immense periods; and in reference to Egypt, it must have required thousands of years to develop the state of things found there when

Menes turned the channel of the Nile. Bunsen gives twenty thousand years B. C., as the date of the beginning of what we find in Egypt, because it would require not less than that length of time, to develop one or both of the two vast families of languages in the East, namely, the Semitic and its antipodal speech.

The Sanscrit is one branch of the early tongue, and is known to have been a dead language four thousand five hundred years ago, or long before Moses, and even then it was the offspring of other dead tongues.

The Rig-Veda is written in that "sacred tongue," yet the Rig-Veda is at least eighteen hundred years younger than another sacred volume, written in a language quite as ornate, full, and complete as that of the Vedas — the Egyptian "Book of the Dead!" The Iranian languages were an improvement on Turanian stocks; and the number of these off-shoots are to be counted by the hundred; and yet there is another and totally distinct class of languages — the Semitic, quite equal to the others, and which was developed in as early ages of the world.

And what is true of language is more emphatically true of the early architecture of these nations. It bursts in upon us in meridian splendor; we look around in vain for its earlier and ruder beginnings.

We behold everywhere in Egypt perfected systems, from first to last; there are no traces of a beginning; we must look elsewhere for the marks of its beginning and slow development.

Egypt and Assyria had made bricks for ages; Babylon and Nineveh had stamped theirs with written symbols; palaces and temples had grown up on the soil of Asia; and elaborate sculptured stone slabs had handed over to posterity, in the language of advanced art, the story of

national greatness. On the banks of the Nile, architecture and sculpture had achieved high triumphs; the pyramids were faced with stupendous polished granite slabs; a forest of gorgeous stone columns supported the temples. Colossal, perfected sculpture arose on every side, and every vacant spot was decorated with a motto or a painting.

What we find in Egypt is perfected maturity; what we do not find is the youth and infancy of that maturity.

As with Egypt, so with Assyria, Chaldea, Babylon, and India; all that we know of the great centers of Asiatic dominion and civilization, speaks only of relative maturity.

It is in vain, then, that we search Africa or Asia for the early eras of monumental history. It is still more in vain that we question written history for any information relative to the primeval world of man. The earliest lispings of history give us but the names of perished empires. She speaks of the East only, and the East, everywhere, bears the unmistakable stamp of a recipient, not that of a Creator. We must look elsewhere for the Master and Teacher.

Archæology is a tame word; it means but little; if it could penetrate and remove the ice of polar continents; if it could explore the Atlantic and all the seas; if it could remove the volcanic débris from buried cities; if it could sift the rock and sand of all the continents; if it could bring back from the soul of things once solid forms, now changed to ashes and the air we breathe; then the dust of the ages would mean something, and archæology would become a mighty word. It is, however, more suggestive than history; it means more than traditions; within its narrow limits it is unraveling wonders; its

skeleton forms, occasionally preserved from decay, fill us with inferences; and ghostly shadows of man's ancient handiwork wrap us in inspirational dreams.

Science alone can give us back the story of the long forgotten past. If you please, philosophy, astronomy, geology, archæology, history, traditions, religions,— God; he alone can organize history from the débris of its ashes, sift the truth from ten thousand sources, and cement the gaps with the gilt-edged lightning of truth.

CHAPTER XXIV.

HUMANITY'S CHILDHOOD — ANCIENT AGE OF BRONZE — EIGHTY THOUSAND YEARS AGO.

Eminent geologic authorities, cited in chapter nine, have placed the ice period, in North America, at a time two hundred and fifty thousand years ago ; these figures agree with astronomy in reference to the changing inclination of the earth, also with the changing relation of the North Star, as well as the changing "sideral duration of the moon."

If we accept the above figures, we must carry the Noachian deluge back to the remote date, at which time the earth's axis was suddenly changed, bringing what had been the old arctic regions, Utah and the United States, buried in ice, under a temperate sun, and what had been a temperate and tropical country, Greenland and Alaska, under the blast of their present ice and cold.

The tremendous lapse of time is implied from every standpoint by which we view it, whether to explain strata of earth above the drift, or the legends and traditions of the world relative to it ; and in the light of close scientific examination it is the inference of the Bible itself.

The great deluge, therefore, must be carried back, through a tremendous past, to a time earlier than has been conceived, approximating two hundred and fifty thousand years ago. These figures are based on eminent authority, and we reserve the right of changing our opinion in the light of new and more correct data.

We have shown, in the preceding chapter, that Bunsen and others, carry Egyptian civilization back to a period forty thousand years ago. We have examined its monuments, analyzed ancient books, ancient religions, and still more ancient traditions. After all, our investigations have been confined to the age of man's latest advancement, an era co-equal with the use of iron.

Back of the age of letters is a history unwritten, of a people who have left no monuments behind them, no relics of sculptured stone, no hieroglyphic workings on rock. Such a people had inhabited the earth for long centuries ; played the tragedies of love and hate, of hope and disappointment ; died and become forgotten, leaving no record of themselves on earth, save a few copper relics scattered on the American continent, through Europe, Asia, Africa, and Australia, long before Cheops or Cephron had reared in Egypt their pyramids, or Nimrod dreamed of a future Babylon.

These people lived fifty thousand years ago, and perhaps this number might be multiplied by two, and still be within the period since they disappeared from the earth and were forgotten.

Their wooden villages have perished, save in spots where favorable conditions have petrified enough to convince us that they were.

They built villages of logs, chinked in with stones and clay, and roofed them with poles and bark, and reared barricades of upright timber as a defense from savage beasts.

In Switzerland is discovered petrified ruins of their villages, in lake bottoms, reared on upright logs, filled in with stone. The ruins of one of these villages is seventy-one thousand square yards in extent : among the

fossil débris are found fishing nets and baskets and numerous copper implements.

More than two hundred of these settlements have been unearthed, favorable conditions of water preserving them, the great bulk of their villages having succumbed to the elements.

Scattered more or less over the American continent are mounds, under which, with instruments and implements of copper, lie the ashes and bones of some ancient unknown race; and from Peru to Lake Superior are found their scattered relics.

Vast copper mines, of some ancient people, are found on the shores of Lake Superior, unknown alike to history and tradition. Here mining operations were carried on upon a gigantic scale, not only along the shores, but out upon the islands.

On Isle Royal, in Lake Superior, vast ancient mines are found in three separate places; and the amount of tunneling exceeded the work of twenty years by one of our large companies with a numerous force constantly employed; in another place a tunnel extended in one continuous line under the lake for two miles.

Extensive ancient copper mines have also been discovered in Bolivia and Mexico; and no traditions of even the Aztecs point back to the mysterious, unknown people who worked them.

The copper period has been one of the perplexing problems to scholars.

Copper implements and symbols of ancient, strange workmanship have been found almost everywhere in Europe; they are especially abundant under the bogs of Ireland, and under the sands of Norway and Sweden, as well as in the ruins of the Swiss lake-villages, and in the

mounds of Wisconsin, Michigan, Ohio, Illinois, and other Western and Middle States.

Prof. Winchell says, "I have in my possession a copper coin which was drawn up in the boring of an artesian well one hundred and fifteen feet deep at Lawn Ridge, Ill.; it was about the size and thickness of a silver dollar, and figured with hieroglyphics of an unknown language." A coin with an inscription upon it implies a government and organized society, as do also the inscriptions on the brick, found seventy feet below the surface in the lower Mississippi Valley. Says Donnelly, "There is a Pompeii, a great commercial city, buried somewhere in Illinois, of the most marvelous character."

The museum at Dublin contains nearly two thousand ancient copper implements and articles, picked up from excavations, wells, under peat bogs, etc.

In Homer's "Iliad" the warriors are armed with iron weapons. The tools employed in the building of Solomon's temple were of iron; this is true also of the buildings of Babylon and the pyramids.

The Etruscans, Phenicians, and Carthagenians were acquainted with the use of iron, and Wendell Phillips has shown that the extreme temper of their steel swords is a lost art.

We are told that Cleopatra spoke to cities by means of iron wires, and that continuous iron rails have been unearthed from the ancient city of Babylon.

Copper is by no means a common metal, and scarcely ever found associated with pyramids, or in the ruins of the ancient eastern civilizations.

It is plain, therefore, that the copper age must be carried back to a time antedating the civilizations of Europe, antedating the ancient cities of India and Egypt,

antedating the pyramids, antedating columns and cornice of sawed stone, all of which speak emphatically of iron, and belonged to the iron age.

Copper instruments and symbols found in abundance under the mounds of North America, in the Swiss lake-villages, and elsewhere on all the continents, together with the discovery of the ancient copper mines on Lake Superior, and in Mexico, throw a new conception upon these ancient races of people; dignifying them to a condition of civilization, energy, ambition, and a spirit of adventure which we associate with civilized races.

Their copper must have been conveyed in vessels across treacherous and stormy seas. These men left their homes, daring to brave the hardships and perils of the deep and of the wilderness, actuated by a spirit of adventure and ambition which we to-day would not be ashamed to acknowledge.

The skulls of this people are small and low, and the hilts of their swords large enough, only, for the boys of our time. Razor-like knives, elaborately wrought in copper, with etchings upon them, representing their ancient ships, have been found in the Swiss lake-villages, and in the American mounds. Three hundred and fifty of these small copper swords, with everything about them indicating a great antiquity, have been found alone in Denmark; and numerous copper implements and instruments of ancient unknown workmanship are accumulating in almost every country.

The fact that the copper age antedates the age of iron, carries it back to a great antiquity.

Its numerous wooden villages have perished; these people have gone forever; God's progress marks the spot; and empires beneath his silent sway, sweep head-

"THEIR WOODEN VILLAGES HAVE PERISHED. THESE PEOPLE ARE IN GOD'S ETERNITY." [315]

long to destruction.[1] He, the while unmoved and heedless, doth hear the rush of mighty generations, as they pass to the broad gulf of ruin, and doth stamp his signet on them, and they rise no more.

[1] There are numerous evidences of some ancient, inhabited, lost continent, which once existed in the Pacific Ocean. These evidences now present themselves in the form of extensive Cyclopean ruins of cities, with sculptured palaces and temples, portions of which still project out of the waters in the form of islands, now barren and uninhabited. These ruins, in many places, extend into the sea until lost in its unexplored depths.

There is not alone a "lost Atlantis" in the Atlantic Ocean; but uncontrovertible proof of some ancient inhabited world, at the present time slumbering beneath the waves of the Pacific Ocean.

A recent number of the "Atlantic Review" contains a remarkable account by M. H. B. Sterndale, of the Cyclopean remains in Polynesia. They are more numerous and extensive than is imagined, and sometimes include gigantic defensive works. In the island of Lele, for example, in the Seniavines (9 degrees south latitude, 160 east longitude), "an island has been walled to the summit, while on the neighboring shore is a wilderness of ruinous castles, the walls in some cases twelve feet thick and from thirty feet to forty feet in height. They are in the form of parallelograms two hundred feet by one hundred feet, some very much larger. Many of them are erected upon islands entirely artificial, surrounded by canals lined with stone, crossing each other at right angles, into which the tide flows." Mr. Sterndale's theory is that early Hindoos reached not only Polynesia, but Central America, and he points to the use by Polynesians of the word "Meru" for "paradise," and the word "dewa" for "spirit," as distinct evidence of this truth, which it would be if there were many such words. This subject needs a much more careful inquiry, and we rather wonder that, with so many millionaires seeking occupation, it has not been the object of a special expedition.

CHAPTER XXV.

HUMANITY'S BABYHOOD — THE PEOPLE OF TWO HUNDRED THOUSAND YEARS AGO — ANCIENT AGE OF STONE.

Scholars have long been perplexed to explain the existence of stone axes and other stone implements, taken from deep pits and excavations, sometimes sixty and a hundred feet below the surface, so numerous that wagon loads of these ancient axes, alone, are now accumulated in British museums; picked up from railroad excavations, tunnels, wells, and otherwise underlying the gravel, and often associated with human skulls and skeletons, and bones of mastodons, mammals, and other extinct species.

In the year 1819, there was discovered, deep buried in the Grampian Hills, the fossil remains of a gigantic whale, perforated by a lance or harpoon of deer's horn. In this same Scotland, digging for the foundation of a church, was found a canoe hewn from a single oak, and within it a stone ax, twenty-five feet below the surface.

In sinking ninety-five wells across the Egyptian delta, the French engineers under De Lesseps, came upon an immense statue of Rameses, the base of which was twelve feet below the surface; they continued to bore, and reached an additional depth of thirty-three feet, when the diggers ran upon numerous fragments of pottery and various stone implements, of apparently savage workmanship. In various other pits, in localities from ten to sixty miles below Cairo, and at a depth of from thirty to sixty

feet below the surface, were found numerous fragments of stone, ivory, and bone utensils, symbols and implements of pottery, mixed with traces of fossil human bones.

In Central and South America, stone arrow heads have been found, perforating the skeletons of mastodons and mammoths, and otherwise associated in such a manner with the remains of various extinct animals, as to leave no room for doubt that man and the mastodon were contemporaries.

Boucher made excavations in the department of the Seine, and found stone utensils and pottery, together with human bones, mixed with those of ancient animals, at a depth where no traces of man had been previously suspected.

Nott and Gideon found a human skull and partially preserved human skeleton, in an excavation in Louisiana in the sand-rock sixty-eight feet below the surface.

In an excavation at New Orleans, the diggers ran into successive strata of sandstone and partially ossified cyprus forests, in such a manner that two gangs were employed, a gang of spadesmen with pickaxes and crowbars, forcing their way through the hard gravel, then a gang of ax-men would cut their way through a forest layer, repeating this process four times, when at a depth of sixty-five feet, they discovered a human skull and skeleton in a good state of preservation.

Dr. Lund, the Danish naturalist, reports human bones of vast antiquity taken from similar excavations in Denmark.

In the museum at Philadelphia is a human skull of undoubted vast antiquity ; and Huxley has in his possession one that he thinks is, at the very least, a hundred thousand years old. Prof. Jamison reports similar human

bones taken from beneath peat bogs in Ireland, the person to whom they belonged having lived and died before the peat was formed.

Dr. Lund discovered in Brazil thirty individual human skeletons, of all ages, incorporated into the solid rock, associated with the bones of an extinct species of half-human ape ; a thick layer of rock covering this mausoleum, attested the antiquity of these fossils.

Prof. Prest reports the discovery of human bones taken from beneath chalk mines.

Agassiz estimated the age of a human jaw which he found in the solid limestone of Florida at one hundred and thirty-five thousand years.

Numerous eminent geologists believe that the fossil human bones found in caves of Europe are not less than three hundred thousand years old.

Ingersoll mentions a human skull taken from the base of Table Mountain, California, a part of the mountain having been formed since this man lived and died.

Donnelly, referring to a human skull found in a cave at Hockdale, of vast antiquity, and resembling the ape species, says: "The man to whom it belonged must have been a barbarian brute of the lowest possible type."

The existence of numerous petrified skulls of vast antiquity, and of the lowest order, speak of ancient savage races scarcely above the gorilla — cave-dwellers, prowlers, murderers, cannibals.

It is the verdict of scientific men that the cave-dwellers of England and France lived before the glacial epoch. Not only did man live during the drift age, but as proven by the revelations of the last few years, long before the age of ice and glaciers, long before the flood.

The evidences of human existence in the tertiary age, an age prior to the ice period, have multiplied, and can be regarded to-day as a demonstration of science.

Even in the lower miocene are discovered the evidences of human existence; and says an eminent writer, "We may believe that before the upheaval of the Alps and the Pyrenees, amid the luxuriant vegetation of the tertiary period, man inhabited this region."

Facts of this class are too numerous to mention; they come to us from every part of the known world.

Let us in imagination go back into ages so far remote that it becomes impossible to distinguish between human fossils which belong to ages before or since the deluge.

Let us go back into the period when these savages lived and inhabited the globe.

What changes this earth has seen I know not; what was then the map of its continents; where the surging flood of its oceans; where the two antipodes of polar ice; where the belt of tropic vegetation; where flowed its mighty rivers; where towered its mountains; where waved the landscape; where the song of tropical birds.

The very axial center upon which the earth revolved and sent its oceans by centrifugal force, bulging at the equator, has been changed.

The great continents, inhabited by these savages, are things of the past; a new day in the world's history has been evolved.

We stand on a new earth, under a new heaven; and picking up these mysterious fragments of bone, pottery, and stone symbols, by the lamp of the nineteenth century science, read the history of a mighty human epoch, that once upon a time existed in the unknown past.

Ancient river beds, crossing the continents in directions totally different from the present, have already been mentioned. Three miles below Niagara Falls, at the whirlpool, on the west bank of the gorge, there is an extensive ancient river bed, filled with gravel and sand, which can be traced to Lake Ontario. These ancient river beds were the channels of the antediluvian world, when this earth rolled on other axial centers, in an orbit more remote around the sun.

Let us picture to ourselves the ancient age of humanity's childhood — savages, that in the ages of long ago inhabited the globe.

We are back in the night of a tremendous antiquity, on strange continents surrounded with strange scenery; but more strange are the semi-human beings around us.

> "Still believe that in all ages,
> Every human heart is human,
> That in even savage bosoms,
> There are longings, yearnings, strivings,
> For the good they comprehend not,
> That the feeble hands and helpless,
> Groping blindly in the darkness,
> Touch God's right hand in that darkness,
> And are lifted up and strengthened."

As elsewhere in human history, races are at war; and the strong encroach upon and slay the weak.

From the earliest dawn of humanity, even from his first animal state, war has been unceasing; and the law of the "survival of the fittest" has reigned supreme in all human struggles, and guided the outcome; the strongest live.

By this law race after race of inferior tribes has been exterminated from off the face of the earth.

"We are Back in a Tremendous Past, Amid Strange Scenery, Surrounded by Strange Savages."[323]

Progress is blind alike to nations, races, families, or individuals; physical and mental superiority has been the watchword of the victorious, carrying death and extinction to the inferior; and the carnival of war has been the universal method of nature's selections.

The women of these early warriors are at work making stone axes, arrow-heads, and other implements from ivory, bone, and baked clay.

In the night we discover the slanting foreheads and protruding jaws of these savages, dancing around fetish fires; their bare chests and long arms are covered with ugly scars, tattooed, and painted; while from the ears and nose are suspended trophies of victorious battle. The dog, obedient to his alert and savage master, is with them; but even he has a savage aspect resembling the wolf and jackal.

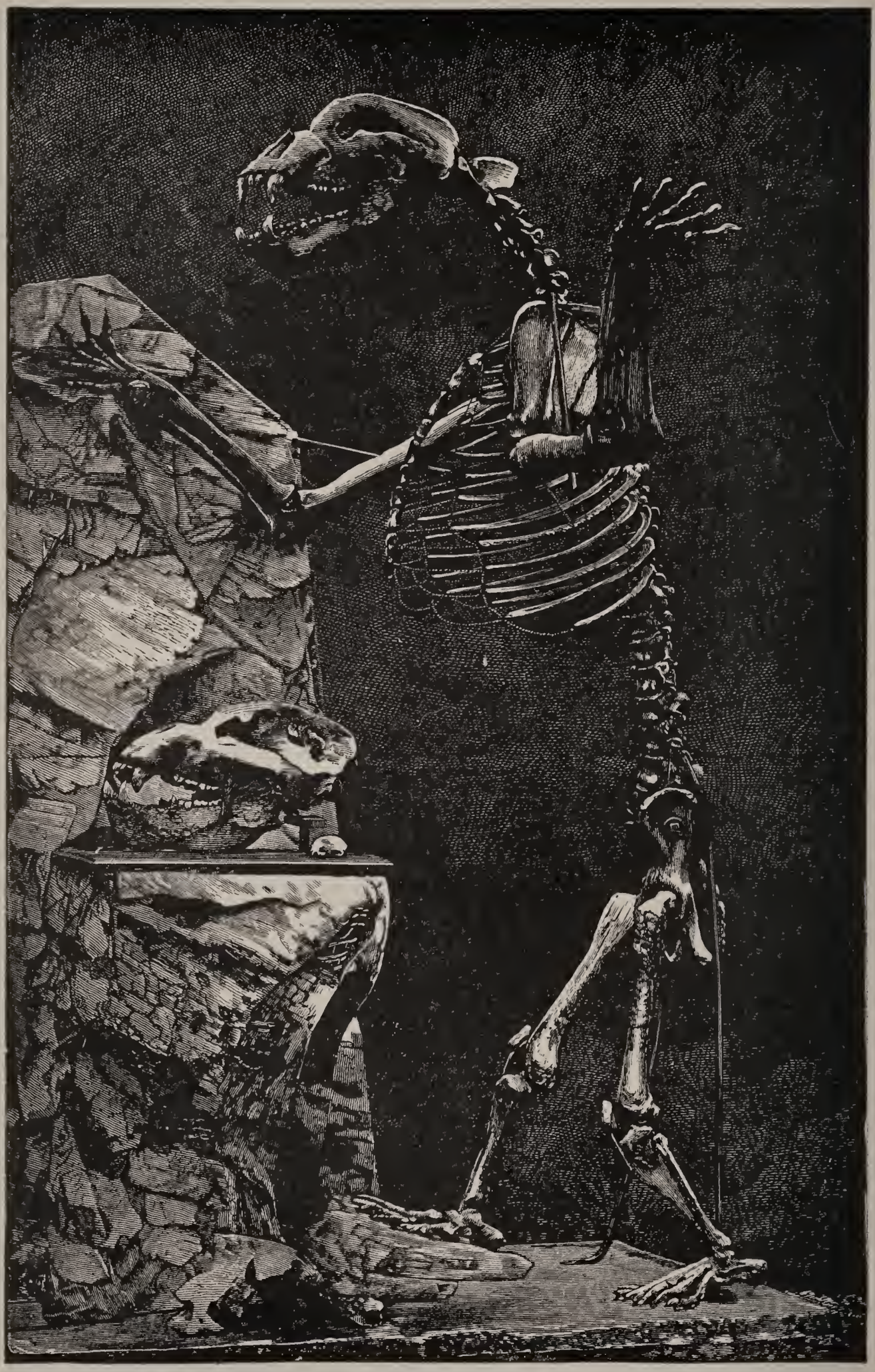
We behold, on different continents and islands, a great variety of tribes; giants and pigmies; red, white, black, and yellow men. Some are partly clothed in skins; and in the colder climates, clad heavily with furs; while the fig-leaf covers the nakedness of the tropics; and numerous tribes, like the Australians, are covered with hair.

Here and there a few have attained considerable intellectual development, and are cultivating wild fruits, roots, and berries, which they store away for winter's use.

Progress is written in this age, as in all prior and subsequent times; we discover in the higher human specimens a dawning "knowledge of good and evil;" a faint trace of the "image of God," and in the heart and brain a rising seed of reason, affection, justice, mercy, and love.

From this ancient stock, through emigrations and exterminations, wars and revolutions, dynasties and over-

throws, experiments with kings and self governments, codes of law exploded and replaced with better, trials with monogamy, polygamy, and free barbarous disregard of the higher affections, resulting at last in the holy alliance of individual homes, with one husband and one wife; arising from the worship of stones, stars, and the sun to the final worship of the abstract principles of justice, mercy, and love, through long and varied epochs has arisen the nineteenth-century civilization; and we behold, to-day, the progeny of the early savages, counting the stars, talking with the lightnings, making the elements their slaves, and struggling to grasp the infinite plan, over which Jehovah reigns.



Fossil Bones of a Semi-Human Monster Recently Found in Switzerland.

CHAPTER XXVI.

HUMANITY'S BIRTH — FIVE HUNDRED THOUSAND YEARS AGO — ANCIENT CAVE-DWELLERS.

It will be remembered that we dropped the thread of our geologic history in the middle of the sixth day, "the age of changing skeleton and coming brain," the age prior to the Noachian deluge, which, according to figures obtained from geologic and astronomic sources, has been placed at a period approximating two hundred and fifty thousand years ago.

In the middle of the sixth day, we had discovered numerous "semi-human beasts," arising to the form and figure of man; numerous "semi-human animals;" unlike, yet resembling, modern orangs, gorillas, monkeys, apes, and chimpanzees, with here and there hand and face, form and figure, prophesying the advent of humanity,

"When God said, Let us make man;"

and we are informed, in the fourth chapter of Genesis, that there had existed on this earth races of beings, in human form, below the image of God, from whom the Adamites, Cain and others, selected their wives, from whose brains and hearts there beamed no rays of Divinity, reason, reverence, sympathy, justice, or mercy: —

"And the sons of God saw the daughters
Of men, that they were fair; and they took
Themselves wives from all whom they chose."

It is therefore plain that the Adamites, having risen above the plane of numerous savage races around them, regarded themselves as the sons, or favored people, of God; but the distinction between the Adamites and other races was not so great as to prevent them from intermarriage, the Adamites, or sons of God, with the daughters of men.

In this early age of the human race, when numerous human forms were closely allied to, and rising out of, the animals, there might have been found every conceivable type of low savages. Like the present Bushmen races that live among rocks and sleep in bushes, branches of trees, or wherever night overtakes them; they subsist on whatever comes in their way, frogs, fruits, snakes, and even the flesh of their dead companions; they have not even the affection or mercy of brutes, for they slay their parents as soon as they become unable to defend themselves. Their heads closely resemble the orang.

The Esquimaux cannot count four, cannot comprehend when this number is added to, or taken from.

Livingstone found tribes of negroes in Africa, so intimately linked with baboons, gorillas, and monkeys, that it was difficult to tell where the one stopped and the other began.

The African baboon is an animal of almost human form and intelligence; they go in tribes, select a chief, establish lines, like sentinels, when gathering fruit, which they throw from one to another, thus conveying it for miles into the hidden recesses of the mountains; their orators, in almost human jargon, make speeches, while the balance listen with silence and respect.

The anthropoid apes are more human than the flat-headed Indians.

The appealing, sympathetic, risable, sensible face of the chimpanzee, is more inviting and human than some negro races, with their thick lips and protruding jaws.

The giant gorilla has the form and make-up, in all the anatomical essentials, of a man; and the form of the pelvis and cranium approach even closer to modern European races than some negro tribes.

Stephens, in his "Arabia Petracia," on encountering a boat-load of slaves from Dongola, was struck with their apish expression and manners, and with their close approach to brutes, says: "It was striking and painful, and I could scarcely draw the lines of demarkation between the lowest of the negro races and their kinsmen; though made in God's image, there beamed no rays of divinity from their countenances, and they sat on the deck with their long arms wound round their knees, upon which rested their chins, precisely as we see in apes; and as I have been electrified while gazing upon these caricatures of humanity, so here I was struck by the closeness of man's approach to the animal kingdom."

The Bushmen lack almost every faculty we are in the habit of associating with human beings; their heads, like the gorilla's, lie mostly behind the ears, with no foreheads, and with protruding jaws, flat nose, and upper lip resembling the monkey; their limbs are long and slender like the gorilla's, and their agility is extreme; while their bodies are covered with hair.

The Angola orang has almost a human face and head, with a beautiful head of hair, "sideburns," and whiskers; its teeth and ears are fashioned like man's, with almost a human pelvis, hand, and foot.

Buffon says: "I have seen an educated orang taught to show company to the door, and bow with politeness.

I have seen it sit at table, unfold its napkin, wipe its lips, make use of knife, fork, and spoon, pour its drink into a cup, touch glasses when invited; it was gentle and inoffensive, and approached strangers with respect."

Orangs, apes, and monkeys display an astonishing power of imitation; they can be domesticated, educated, and made useful.

The Bosjesmen woman, known by the name of the Hottentot Venus, who died in the museum at Paris, is an excellent example of her race as described by Cuvier: "She would pout her lips exactly like the orang; her movements resembled the ape; her lips were monstrously large, and she had ears like the monkey, and her head receded in front like the gorilla."

The Hottentot type, through the whole of Southern and Eastern Africa, bear all these marks, but especially so in the Bosjesmen type.

Cuvier regards the Bosjesmen species as the lowest and most animal of human types, bridging the supposed chasm which separates man from the anthropoid apes; there are types of this race where the legs are bent outward and completely devoid of thighs and calves, while the feet are long and large, almost like the gorilla's; their voices are feeble and hoarse, the intellect low and dormant, and the passions, when excited, become brutal in the extreme, while many are lower than the brutes in the fact of cannibalism.

Monkeys, apes, and chimpanzees have been trained and adapted to various kinds of domestic labor; there is a mine in North Carolina where monkeys are at the present time employed to pick up shining particles. Monkeys have been taught to act the part of sailors, becoming very useful, especially for furling sails and coiling ropes in dangerous places, being excellent climbers.

Tyrcord says that in his time the colonists of South Africa employed chimpanzees in various departments of labor.

Breton has in his Chinese pictures a representation of monkeys gathering tea leaves. The ancient Egyptians made serviceable a variety of baboons remarkable for their intelligence.

The ape is unquestionably the most man-like of the lower animals. He is far below the higher races of men, but the difference between him and the low human races, is less than the difference between these and higher human races.

The black chimpanzee of Africa not only resembles many of its negro cousins in physical contour, but in character and habits as well. These baboons, like the negroes, live in communities, fight in concert, using clubs as weapons, and throwing stones with great accuracy. They also care for their wounded with a kindness and sympathy that would reflect credit upon higher races.

The possession of language does not separate man from the animals. All animals have intonations by which they express their desires. Language is the expression of thought, and brutes assuredly do this to each other. The dog calls others to him by a peculiar bark; the lion roars; the tiger growls; the birds sing; each has a language of its own, to manifest affection, call its mate, or vent its rage. The organs of speech are present in all animals, and on their development depend the sounds employed by each species. They are quite imperfect in the orang, more perfect in the negro, yet not sufficiently so as to enable him to articulate difficult combinations of sounds.

Man must have begun his existence as a low savage. If we trace history backwards into the night of traditions,

we find all early nations to have been the rudest savages. In the dim twilight, mythology reveals its Protean form, and sanctions our conjecture. The farther backward we go, the lower man becomes, until, lost by history, tradition failing, reason inductively concludes that he must have been extremely low at the beginning. At every step we take in the opposite direction, man becomes better and wiser. At no period of the past has he been equal, either intellectually or morally, to his present attainments.

In England, France, and other countries are discovered ancient caves bearing the evidences of a remote antiquity, containing skulls and skeletons of semi-human beings, mixed with feathers, shells, and bones of birds and animals, split open as if for the purpose of extracting the marrow.

Topinard, the French anthropologist, says: "By joining together various skulls of these ancient cave-dwellers, they discovered a remarkable sinking of the frontal vault, resembling in many respects the skulls of anthropoid apes; the skulls of many of the ancient cave-dwellers remind one of the female gorilla, and yet they are clearly human; in fact, there is no possible doubt of it."

In a collection of pliocene and miocene skulls by De Quatre, the French naturalist, he gave the generic name, "Constadt race;" he says, "At the tremendous remote period when these skulls lived, there was a great variety of races." We cannot deny the fact that superior races increase in number, while inferior ones disappear; the strong make war upon and exterminate the weak; this has been the law from the earliest times. Speaking of the Constadt and Cro-Magum races, Topinard says: "We saw that they were the skulls of men in the sense

with which we use the term, but far more allied to apes than to present intelligent races."

Comparing the skulls of the races of fifty thousand years ago, or the copper period, or even the skulls of the stone age of one hundred thousand years ago, they seem as yesterday in everything that gives human appearance, contour, and shape, when compared with these ancient pliocene and miocene skulls.

The ancient cave-dwellers were unacquainted with the use of fire, as proven by the absence of ashes near their nests and hiding places; a knowledge of the use of which is the first great attainment which elevates man above the animal kingdom.

"There were," says Topinard, "in the obscure ages of a half million years ago, a great variety of these half animal, half human races; some with little round heads, others with narrow flat heads, so closely allied to extinct species of orangs, apes, monkeys, gorillas, and white tailless Mexican dogs, that it is often difficult to classify or determine what are animal or what are human skulls and bones."

The human skulls above described belong to the tremendous past, and their variety, in form and size, become greater with each backward flight into the remote ages.

When these races lived and inhabited the globe, they were crossing and amalgamating, and slowly climbing upward to symmetry, intelligence, and a dignified bearing, when God said,

"Let us make man in our image."

His creative fiat worked on in slow, patient, progressive methods, producing step by step an order of human beings approaching nearer the dawn of the day in which we live.

The carnage of strife and war went on through long

centuries, in which the weak were exterminated, and their places usurped by the strong; the fittest survived.

In the early struggles between the crude races of men, wherein the forces were at work evolving a higher humanity, the vise of nature's pruning and molding was terrific and severe.

Survive or perish, invent means of defense against more barbarous races, and learn the art of providing subsistence against emergencies, or take your tomb in the petrified bones and ashes of oblivion.

In union is strength; create families; organize into colonies; form governments; organize and constitute a society; become the Adam of the world, with dominion over all the races of the earth, or die, fall beneath their power.

With the birth of every intellectual new principle man has changed, accordingly, face, head, and form; and through the long ages of progressive amalgamations, not only in physiques, but in languages, ideas, and governments, has come civilization, has come Adam, a race bearing the stamp and signet of all the gods.

We have linked the history of the evening and the morning of the earth's sixth day, and seen the dawn and ending of an age of changing skeleton and coming brain; and have again verified the axiom that nature is the name of every effect whose cause is God; who sleeps not, is not weary; with whom slow circling ages are as transcient days; in whose mind time is marked by great revolutions in events; WAY MARKS OF TWO ETERNITIES; and as slowly progress has been upward, the record has been left in the earth, so that man can walk backward, and learn from whence he came.

GORILLAS IN AFRICA. [337]

CHAPTER XXVII.

BETWEEN TWO ETERNITIES.

It has been said that "there exists between man and the animals an impassible gulf." The brave author of "The Vestiges" flew his kite, and landed it safely beyond the waters of this great gulf, by means of which Darwin drew across a firmly fixed wire; Huxley and Heckle wound it with cords; and we have also worked upon it, making firm and strong the cable of the future great and popular bridge of science.

When a small boy, my father took me to see the beginning of the then projected scheme of the Hoosac tunnel, where men were at work boring from the two sides of the tremendous mountain of solid rock, forcing their way towards a common center.

Such has been the plan of this book; on the one side of creation we began at the beginning,—God,—and tunneled our way step by step into the middle of the sixth day; on the other side of the mountain, we began with the present, and worked our way backward through human history, bronze ages, stone ages, and cave-dwellers; and in the middle of the sixth day our openings have met, and we stand between the barren peaks of two eternities, surveying the beginning and the ending, the past and the present.

Let us now ascend to the top of the mountain, and sink shafts from above, letting in floods of living light

upon all the past, and from this new position between the eternities, contemplate all the future.

The author selects this little nook to pay tribute to the schools and teachers of his boyhood, the full-grown seed of whose sowing is this book.

To Dr. Torsey and the professors of the Maine Wesleyan Seminary at Kents Hill, where he prepared for college.

To Drs. Stearns, Everett, Hedge, Clark, and the rest of the literary department of Harvard College. To Agassiz, Emerson, Longfellow, and that galaxy of scientific and literary stars that haloed the three years of his life spent in Cambridge, in a stupor of study, with visions and dreams.

Nor would he forget to make a passing reference to the professors of his later surgical course, whose names are appended to his medical diplomas.

CHAPTER XXVIII.

GENERAL SURVEY OF THE LAWS OF PROGRESSION.

The tendency of scientific thought has been to trace the origin of man back to single pairs.

True, as individuals, each one of us sprung from a single pair; this is as far as such a philosophy can be carried.

Each one of us had a father and a mother; therefore when we trace back our individual genealogies, we write first the number 1,— the me,— to explain which we discover the number 2 — a father and a mother; and to explain them we discover the number 4 — their fathers and their mothers; while the number of their parentage becomes 8; each of which had a father and a mother, and the number is again doubled; and so on indefinitely.

Hence, as we go back in our genealogies, the number increases in this doubling geometric ratio with each antecedent generation, and by a few moments' figuring, we go back to a time when one million of our ancestors lived, all at the same time, on this earth; they represented widely different races, spoke different languages, and inhabited various sections of the earth.

I see no law going back from multiple to single; on the contrary, the genealogy of all life goes back from single to multiple; and life itself becomes more numerous, in the same geometric ratio, as we go back from

high to low, from single to multiple, through all the generations and gradations downward and backward in the past.

Therefore, it required millions of uniting generations of chemical principles to produce one spontaneous germ; millions of uniting generations of germs to produce one coral; millions of uniting generations of corals to produce one mollusk; millions of uniting generations of mollusks to produce one fish; millions of uniting generations of fishes to produce one reptile; millions of uniting generations of reptiles to produce one mammal; millions of uniting generations of mammals to produce one ape; millions of uniting generations of apes to produce one savage; millions of uniting generations of savages to produce one civilized man; millions of uniting generations of civilized men to produce one Shakespeare.

In the chapter on the mechanics of life, we found vital phenomena to consist in the union of a number of nature's forces, and rising in a scale according to the ratio of complicity; and here again we find unlike chemical elements uniting to form protoplasms; unlike protoplasms uniting to form globules; unlike globules uniting to form cells; unlike cells uniting to form organized beings; organized beings uniting to form higher types; races uniting and mixing their bloods to form great nations. This is true philosophically, words uniting to form languages, languages uniting to form ideas, ideas uniting to form sciences, sciences uniting to form great systems.

Man has become the antitype of the universe; in him all the forces of nature have locked their hands in union, and crowned him the Deity of the world

The great anatomist, Odin, struck with the discovery that man embraced the combined physiques and mental powers of the whole animal kingdom, gave utterance to the then startling statement,

"Man is the sum total of all the animals."

We might add, the combined mentality of all the animals; he has the bravery of the lion; the cunning of the fox; the sagacity of the dog; the ingenuity of the beaver; the perseverance of the spider, the sensitiveness of the rabbit, the slyness of the cat, etc.

If the early races of savage men sprung by crossings from lower types, it is absurd to suppose that they sprung from a single pair.

Life was crossing and climbing upward everywhere, producing slow and insensible changes; and at every point of the inhabited globe, evolving new types and higher species.

It was the continued admixture among animal forms which brought into being a great variety of orangs, monkeys, gorillas, apes, chimpanzees, etc.; it was the continued admixture among these which developed the first shadows of man; and the long-continued amalgamations among the half human races that evolved savages; and it was the admixture of barbarous races which has made enlightenment; and it is to-day the admixture of nations and bloods, that is developing the highest civilization; wherever this stops, progress stops, and decay begins. Consanguinity is the destruction of families and the death of nations.

America, made up as she is of the races of the earth, and vaccinated with Indian, Chinese, and African blood,

will develop new forces, symmetry, and beauty of physique, when the right proportion of these shall have become amalgamated. Already we hear it sometimes said that the octoroons of the South, a mixture as they are of one-eighth negro blood, are surpassingly beautiful, and their intellectualities, without advantages, are surprising.

America, in the remote future, will see in the South an aristocracy of brunettes; and by a collateral intermixture of the light-colored races of the North, an aristocracy of blondes; in whom will sing the muses of refinement, scholarship, and art.

It was precisely such an amalgamation of races, some of whom were pure white, and others red, with an admixture of black, brought from the heart of Africa as slaves to Egypt, that after a long train of generations gave to Egypt a new fire, and developed her greatest civilizations.

For several hundred years, however, American enlightenment, wherever the intermixture of negro blood takes place, will sink in the flood of ignorance and coarse material; but out of a long night will come a new and glorious day.

Going back from the present to the early savages, the lines of difference between races, in size, contour, color, etc., become greater with each backward evolution; and accordingly we find pictured on the tombs of Egypt a great variety of races, with extremes from pure white to jet black, from large to small; thus the lines of demarkation become greater in races going backward in the past, until we get back to the great dissimilarity of the early races, whose remote cousins of to-day are the orangs, monkeys, apes, gorillas, etc. Let us write this law in an exact formula:

The differences in races become greater in the ratio of the generations of ancestry; the types more dissimilar through all the gradations downward and backward in the past, until we come to the great dissimilarity of elements, which underlie all life; a union of which constituted the first and simplest life on our globe.

Carbon and oxygen cross to form carbonic acid, hydrogen and oxygen cross to form water, hydrogen and nitrogen cross to form ammonia; these three, carbonic acid, water, and ammonia, cross to form protoplasm; nitrogen and oxygen cross to form air; air, water, and protoplasm cross to form living germs; and so on upward with the intricate and increasing complexity, until we arrive at the highest embodiments of life in the civilization of the nineteenth century.

We herein discover that what has been urged as an objection becomes an argument in support of progress, the increasing varieties and greater differences of types as we go backward and downward; to illustrate, assuming that these comparisons represent early human races: the ugly Hottentot, the little Eskimo, the red Indian, the black negro, the white Icelander, the hairy Australian; and wider still the difference between apes, orangs, and monkeys, and so on backward through a thousand diverging lines of the animal kingdom.

Thus nature has worked from a thousand dissimilar points and a thousand dissimilar methods, approaching nearer and nearer her ideal, at every crossing or union of dissimilars, until she has evolved mankind, a being of symmetry and mentality.

True, nature has fixed limits to her crossings; but she has left a broad highway from nature up to man. In

other words, she has protected and made secure her advance at every step ; man cannot cross with the animals, nor the animals with reptiles, nor reptiles with fishes : let us write this law in an exact formula :

Elements of similarity must predominate over elements of dissimilarity in parentage to beget offspring, and by the affinity of similars, lock into one organization other dissimilar principles.

The adhesion of similarity can alone chain the elements of dissimilarity ; this is the law of all crossings, from the lowest to the highest ; and this law walls in and makes secure every step of advancement in the great highway from low to high, from simple to complex, from nature up to man.

We herein discover that nature is working towards the perfection of all the great plans of animal as well as human life.

In our studies of geology, we were struck with the incomplete and chaotic crudeness of the fowls and reptiles of the fifth day ; wings, limbs, fins, organs, and parts, seemed mixed in strange discord ; but the laws governing crossings have gone on through all these mighty ages, and to-day all the great plans of animal life present the same perfection of structure as in man.

Thus we find great highways walled in by the immutable laws of nature, and leading up towards the perfection of all her ideals.

With this law of progress aiming to amalgamate into a final homogeneous whole, the imperfect parts of all the ideals towards which nature is struggling, and in the end absolutely to perfect the human type ; combining slowly the heterogeneous and dissimilar parts, raising the whole towards a high ideal ; towards a homogeneous amalga-

mated perfect; with an infinity of ages ahead, and an infinity of material upon which to build — out of this complex, heterogeneous, and infinitely varied human sea, what a sublime destiny is prophesied for man! However slow and painful each individual step in the ladder of progress, there is prophesied in the end an amalgamated, homogeneous perfect; there is in the distance a Christian millennium; for in these innumerable laws of progress —

> "I beheld a ladder upon the earth,
> And the top of it reaches to heaven."

The entire philosophical system of Spencer is built on a principle seemingly the reverse of the position we have assumed in this chapter; and his one fundamental law of evolution is that all things are running from the homogeneous into the heterogeneous, from the simple into the complex, from the unit into the multiple.

We admit the truth of Mr. Spencer's position, viewed from the one side of the complex sea of creation; but his is only half the truth, and there is another compensatory collateral law seemingly its reverse, which we have elucidated in this chapter.

Mr. Spencer's position is true, units evolve multiples, and we have shown that multiples evolve units; the homogeneous is constantly evolving the heterogeneous, and the heterogeneous again running into the homogeneous; with a law of progress by its side, and a law of retrogression; the progress of the ideal and the retrogression of all the imperfect counterparts; a final homogeneous perfect, and not a heterogeneous imperfect, are the final aims of nature in all her departments.

Nature is aiming towards the perfection of a homogeneous humanity, and not a heterogeneous map of

difference, strife, and war; to a final homogeneous mind, and a final homogeneous heart, when "every born of woman" shall inherit equal possibilities, and humanity, actuated by the same impulses, loves and feelings, hope and faith,

> "Shall beat their swords into plowshares,
> Their spears into pruning hooks;
> Nation shall not rise up against nation,
> Neither shall they learn war any more."

CHAPTER XXIX.

THE HUMAN EMBRYO — ITS DEVELOPMENT IS A MINIATURE REPETITION OF THE HISTORY OF LIFE'S PROGRESS ON THE GLOBE.

"THERE is a path which no fowl knoweth,
Which the vulture's eye hath not seen,
In the shut-up doors of thy mother's womb."

The development of every human embryo, from protoplasm to a mollusk, then to a fish, next to a reptile, next to a mammal, afterwards to a fetus, then to birth and babyhood, through childhood to manhood, corresponds with and repeats in miniature, the history of the development of life on this globe.

The human embryo begins as an unorganized chemical compound. The elements next arrange themselves in a crystalline form, and it becomes protoplasm, precisely such as the elements assumed far back in the past when they were mixing and uniting to form the first protoplasm on this globe.

The human embryo next becomes a single minute cell, representing the early geologic age of corals.

The human embryo next becomes a cluster of cells, typical of the next geologic age of sunfishes and low mollusks.

The human embryo soon exhibits a single cavity or heart-sac, typical of the heart-cavity of higher mollusks, and in this stage represents the geologic age of mollusks.

The human embryo next assumes an outline scarcely distinguishable from the fully-developed embryos of

fishes; here the human embryo represents the geologic age of fishes, each possessed of two chambers in the heart.

The human embryo next assumes strange dim outline of limbs, representing the age of reptiles or fowls; at this period each has three chambers in the heart.

The human embryo next takes on a form indistinguishable from the embryos of animals, each having four chambers in the heart; at this period the human embryo represents the tertiary age of mammals.

The human fetus continues to develop, and assumes the facial angle of apes and monkeys, and represents the highest type of life on this globe prior to the advent of man.

The human fetus assumes a still higher facial angle and forehead, representing the early cave-dwellers, and low savages.

The human babe comes into life ignorant and helpless, corresponding in mental characteristics with the early barbarians.

The human babe rapidly brightens, its head changes, and it represents the ancient age of stone implements.

In childhood is represented the ancient age of copper, bronze, and implements from the soft metals.

The child continues to develop, representing the evolutions of civilization, with its conflict of peace and war, and various revolutions and evolutions of ideas.

Thus the child repeats in miniature the story of man's slow and painful evolution from the animal kingdom to the present giant civilizations.

Nature, ever kind to us, has tied up here in the development of the human embryo a story of all the ages, showing us the beginning and all the upward evolutions

over which life has travelled in its long journey from the first dawning cells of the life of cycles of ages ago, through all its upward advancement, age by age, until the mighty civilizations of the present.

Every living thing, regardless of its future, begins in embryo precisely alike; their successive upward evolutions, side by side, step by step, are precisely alike; and the future type of all forms of life is determined by the point where embryonic development stops, where hereditary advancement stops.

This law of embryonic progress and metamorphosis from low to high, might be compared to a great highway, where the elements swarmed with germs, like motes in the sunbeam, led by the genii of Aladdin's lamp, who touch the lamp at every mile-post, and the leading part of the swarming sea of living germs is slightly changed.

Pursuing his journey, he touches the lamp at every mile-post, when the advancing part of the swarming caravan of beings is changed; he repeats this process at every mile-post, producing an order of beings higher and higher, at each mile-post evolving a new order of beings.

He pursues this journey through the geologic ages, and repeats it in the winding path of the development of every human embryo, producing at every mile-post a higher type of beings, until he becomes the captain of the Websters and Edisons of the nineteenth century.

Science with its lamp of logic, its microscope and telescope, winds its way backward in the footsteps of the path of the creative genii, and discovers an exact order and law of development in the evolutions of all life.

Science again retraces its steps, and marks the mile-posts of geologic and embryotic advance; and discovering a unity of plan in the development alike of life itself on

the globe, and each individual life, makes the chart the base of all classifications of the ascending series of life.

Agassiz, seizing this clue, with the acumen of a master mind, made a classification the most perfect science has seen. He decides the rank of species in the scale of classification by embryology. If he wishes to determine which is higher in development, the sturgeon or the white-fish, he watches their embryonic changes, and discovers the sturgeon stopping, with a cartilaginous prophecy of bone; while the white fish evolves a step higher, and fulfills that prophecy in the development of a bony skeleton.

In view of this law, how clear becomes the explanation of partially-developed organs, found in all types of life; the outline of wings under the skins of beetles, the presence of teeth in the fetus of the whale, the stump of a tail in the tailless breeds of cattle, or re-appearance of minute dangling horns in hornless breeds.

The tadpole of the common salamander has gills, and passes its existence in water; but the salamander-ultra lives high up among the mountains, and brings forth its young on dry land. Shortly before birth, however, these embryos are found swimming in water, with exquisitely feathered gills; these embryos repeat the history of their ancestry, which slowly acquired organs and capacity of living out of the water.

The boa-constrictor has rudiments of pelvic bones and hind limbs, placing him above ordinary snakes; here is enacted the dream of nature under impossible conditions, like the imperfect nails which sometimes form on the stumps of amputated limbs. Another evolution of the embryo of the boa-constrictor would place him among the reptiles with limbs and bony skeleton structure.

The limbs of man have been traced back step by step, through the comparative anatomy of the whole ani-

mal kingdom, to the thread-like extensions from the sides of the lepidosiren.

The amphisbænoida has neither head nor skeleton, but a line represents the spinal nerve, this being an early condition of the larva of all mammals, even the embryo of man.

Says Von Baer: "The embryos of mammalia, birds, snakes, and lizards are, in their early stages, so exceedingly alike, both as a whole and in the development of their parts, that it is often impossible to distinguish young embryos only by their size.

"In my possession are two little embryos in spirits, whose names I have omitted to attach, and at present I am quite unable to say to what class they belong; they may be snakes, lizards, birds, or even the embryos of higher animals, so complete is the similarity of the formation of the head and trunk of the embryos of all living things. The limbs are still absent, but even if they existed in an early stage, we could learn nothing; for the wings and feet of birds, the limbs of animals, and the hands and feet of man, all arise from the same fundamental form."

"This is true," says Darwin, "whether it be the young mammal nourished in the womb of its mother, the eggs of a bird hatched in a nest, or the spawn of a frog under water."

We have already stated that at the first inception of life, whether it be insect, fish, reptile, bird, mammal, or man, the initial cells scarcely differ at all; all that could be predicted is that they are germs of life unfolding.

These germs are the simple minute balls of a blind faith, with the history of their ancestry tied up in them; by which alone, and by the environments hereafter to surround them, will determine whether they shall occupy a

high or a low place in the world; becoming accordingly snake, bird, fish, beast, or man.

Our lives, and the life of every living thing, is but the unfolded soul of a former faith, former histories, lives, and experiences, in blind faith repeating themselves, with the impress of their ancestry stamped upon them at the very inception, and fulfilled in the law of the subsequent environments which surround and develop each.

Nearly every scientific, experienced physician has in his possession human embryos, thrown off at every stage of development, the product of disease and unavoidable accidents; sometimes, however, to the disgrace of human character, the product of malpractice on the part of those who have sold their souls and the honor of a high calling, for thirty pieces of silver, and become the accomplices of a large class of unnatural husbands and wives, who have fallen to a condition below any example in the animal kingdom.

"Write them childless, those cold hearted
Who could spurn the generous boon,
And whose souls with fear hath smarted,
Lest thy blessings come too soon.

"While he hath a child to love him,
None can be poor, indeed,
While he hath these friends beside him,
None can sorrow, fear, or need.

"But for thee, whose hearth is lonely,
All unknown to children's mirth,
Spite of riches, thou art only
Desolate and poor on earth."

Every one can have access to the observation of embryonic development within certain limits, by observing the hourly, daily, or weekly changes of incubating hen's eggs — first a minute cell; then a layer of minute cells

resembling a vegetable leaf; then successively, several layers of cells; and between, a layer of blood cells; then the coiling of cells, like the coiling of a leaf into a dark line, gradually encircling a semi-glutinous fluid;—here is represented the lower mollusks; next two white fibrous sheaths are seen side by side, with a series of dots or cells between, while below is found a central cavity; here is represented the heart and structure of higher mollusks; the line of dots finally develop into a spinal nerve and column, and the heart divides into two cavities; here is represented fishes; the bony structure next develops with strange, dim outline of limbs, and the heart divides into three cavities; here is represented reptiles, fowl, etc.; the embryo of the incubating egg has made its last metamorphic change; it is now the fetus of a hen, hereafter to develop in the line of hereditary stock; finally to evolve the fully developed hen. In this embryonic stage is represented the origin of fowls on the earth as a simple radiation from the embryos of other reptiles, each of which is precisely alike. We herein discern a confirmation of Genesis and geology that fowl and reptiles are allied to each other, having sprung out of the waters of the same age,—

> "Let the waters bring forth abundantly
> The moving creature, and fowl that may fly above
> The earth in the open firmament of heaven."

Fowls and reptiles are a mere divergence of the same embryos, having previously been the embryos of fishes, and still earlier of mollusks, and still earlier a leaf of cells, and still earlier a single cell.

In the wonderful transformation which batrachians undergo, the circulation of the blood is changed in accordance with the change in the organs of respiration. In an

early stage they have external gills, which appear as long fringes hanging loosely upon the side of the neck; the external gills soon disappear, and are replaced by internal gills, when the tadpole exhibits its most perfect fishlike form; its mode of locomotion also corresponds with fishes; its breathing is essentially like fishes, water entering the mouth, and is carried through the gills; the lungs and arteries, at first rudimentary, increase in size, while the gills diminish, along with the blood-vessels connected with them, and the gill-breathing is gradually transformed into a lung-breathing animal. With these changes others no less extraordinary are going on; a pelvis forms, and limbs sprout forth which become at last perfect and powerful; in the meantime the tail has shortened, and disappeared, and the embryo is now frog, lizard, or salamander.

Unlike the embryonic evolutions within the womb, or others within an egg, these embryonic evolutions, from the first microbe or cell, can be hourly observed, in all of its changes, up to its almost human form in miniature.

Science has verified the aphorism of the ancients, "all life springs from the egg" or first cell, whether vegetable, worm, fish, bird, mammal, or man. All life not only develops by the multiplication of cells, but perpetuates its progeny by the division of its own cells. In many of the low forms of life, worms, etc., life is propagated by simple divisions, or separation of the individual into many entities. If an earth-worm or a polyp be divided into several pieces, each fragment becomes a perfect animal; also in vegetation, a willow branch planted in a moist soil soon assumes the shape of a perfect tree. In consequence of this faculty, many animals are able to reproduce parts of their bodies when accidentally lost; for it is well known that lobsters, crabs, and spiders, on losing limbs, acquire new ones. Lizards reproduce the tail

when removed, and in salamanders the bulk of the head may be amputated, including the eye, with its complicated structure, and new ones presently sprout out; this power is illustrated in our own bodies when a broken bone or other wound unites.

All life springs from the egg, which is of itself a mere division of the cell of its ancestral life. From this "rib" "taken out of man" and uniting with the "rib" taken out of woman in the form of an egg, does all human life perpetuate itself.

As the multiplying cells of vegetable life first evolve the leaf, which is coiled to form, alike, heart cavity or stem, and still further modified in fruit and flower; so also the multiple celled leaf composing the embryos of every living thing, are coiled and become the substance of the structure of every organ of life, through all the animal kingdom, even to the brain of man.

The record of Genesis is here confirmed, that vegetable life first existed on the globe. This is true, not alone in herb yielding seed, but the early stages of all life.

Man himself begins his development as a pure vegetation by the simple multiplication of cells, and the first cell of his commencing life is as truly the "rib" of his parentage, a division and cell of his life, as the growing willow sprout.

"God caused a deep sleep to fall upon
Adam, and he took one of his ribs, and
Closed up the flesh instead thereof, and
The rib which the Lord God had taken
From man, made he a woman. She shall
Be called woman, because she was taken
Out of man. Therefore shall a man cleave
Unto his wife, and they shall be one flesh."

All life, high or low, propagates itself by simple division; this is as true of man as of the earth-worms, or the transplanted willow sprout. The offspring is evolved from a cell divided from, or taken out of, the parent branch, or stock.

The new life commences as a cell taken from the father's own life, nourished, vitalized, and fed with the protoplasm of a mother's egg; here cell multiplies other cells, adding to itself and evolving step by step upward, developing higher and higher, until it bears the unmistakable signet of its parentage.

All forms of life commence development at the same point, the cell. Man has gone over as many and distinct metamorphic changes, as the sum of all the types of life below him; he has passed as many changes as, and greater than, the tadpole or caterpillar, as he is higher.

All life begins at precisely the same point, and diverges in proportion to the number of its metamorphic changes. What nature has accomplished by the evolutions, in the slow process of all the ages, she now rapidly repeats in the development of every human being.

Thus far, in this chapter, we have been studying the origin, evolutions, and birth of this human corruption. Place by its side the beginning and development of this mind in man; this kingdom perchance of virtue, benevolence, sympathy, kindness, justice, and reverence for things above and beyond; this seed which in the human heart is—

> "Like a grain of mustard seed, the smallest
> Of all seeds; but when it has grown,
> It becomes the greatest of all trees,
> And the birds of heaven lodge in the branches."

CHAPTER XXX.

PLANTS AND ANIMALS COMPARED WITH MAN — ALL LIFE BUT VARIATIONS OF ONE PLAN.

What is there in common between a tree, birds warbling in the branches, or man enchanted by the symphonies of their music?

The first scientific difference between vegetable and animal life is in the relative proportion of chemical elements composing them.

The elements underlying all forms of life are oxygen, hydrogen, nitrogen, and carbon; in vegetation, however, nitrogen is found less abundant than in animal tissue.

Man and the animals consume oxygen, and give out carbon through their lungs; while plants, breathing with their leaves, inhale carbon, and give out oxygen; they are composed alike of a multiple of cells and nearly the same elements.

We observe as we ascend step by step upward, from vegetation to animal life, a difference in the arrangement of cells, and the consequent formation of organs.

The leaves of plants, which answer to the lungs of animals, instead of being clustered into one pair of lungs, are scattered in countless numbers over the branches.

In plants, food is absorbed by means of numerous roots, while similar absorbents, the villi of the lacteals, cover the surface of a central cavity, forming the stomach.

Vegetation can exist on crude inorganic substances, while man and the animals subsist on the same substances refined through vegetable growth.

Man and the animals begin development from eggs or parent cells, plants from seed, another form of ancestral cells. These eggs or seeds are extracted by the division of the parent in precisely the same manner as a cell or living piece of an earth-worm will produce another worm; or a graft of willow, as well as the seed, will repeat the parent tree.

Nature's seeds,— the prepared cells of animal life,— require the nourishment and vitalizing environments by absorption into the female ova, where cell unites with other cells, extracted from the female life; these are necessary conditions of growth and development.

The ova of man and the animals or the seed of plants is but a higher method of division, which in the polyps multiply by their own disintegration, each part becoming a progeny.

Nature's general laws of the reproduction of all forms of life do not essentially differ. Nor do these methods essentially differ from the methods by which nature germinates inorganic crystals, each after its kind. Nor do they essentially differ from the methods by which nature evolves new worlds in this canopy of stars; their dawning fires were all lit by the fire of a parent sun.

Explain to me, atheists and materialists, you who believe in evolution and the developments of nature, why should the seeds and eggs of the varied types of life, which chemically do not differ at all — why should these germs produce such wonderfully varied fixed results?

You trace living things, through a series of evolutions, back to eggs and seed; you trace life itself back through long ages to the germs of its beginning on the globe; you trace the globe itself back to a beginning in chaotic nebula, then you think you have solved the whole mystery; you

have, you say, no use for a God ; nature has evolved it all from the eggs and seed, from the chaos of long ago.

But stop ; from the standpoint of your philosophy, you have created a greater mystery ; the latent possibility of a universe prior to the universe ; the eggs and seed of the long ago, encircling a mighty plan, hiding a wondrous design ; this is my God.

You ask me who made God. I ask you who made the germs and seed, who tied up in the ages of long ago the plan of this wondrous unfolding, with all its moving suns and varied, sentient, feeling, thinking life?

Amid the clouds and darkness, the chaos of the early beginning, I behold an omnipresent and omniscient Mind, holding in its power the plan and history of this universe, in all its wondrous detail.

Call the eggs, the seed, the dawning chaos, by the scientific name of matter, if you please ; ascribe to that chaos of matter, a cosmic will, a cosmic force, a cosmic intelligence, and a cosmic love, out of which by the force of fatalistic causes, has come the universe ; but grant me the sublimer, grander philosophy and name, contained in the one opening line of that book of books, "*In the beginning, God.*"

As in the eggs and seed of all life, so, also, in the cosmos of the dawning creation, was inscribed the fixed and future plan, the exact order of unfolding.

Creation was as complete in the cosmos as it is to-day in its fulfillment. The stupendous volume of the infinite creation was written in all its sublime detail, and the ages were all classified and numbered ; mandates of imperative law had fixed every boundary, had prescribed the lengthening column of all the years ; hid away in that cosmos was the order, and all the pictures of present changing

phenomena; all the architectural designs; the human map, and the human history, were hid away in the vista of that chaos; there was a code of ethics, and the shades of every prophet; there was the map of pyramids and cities; there the flaming sword sheathed, and in its scabbard; there the deluge of Noah, stamped on parchment and in model; there the kings of earth and the ascending smoke of every war; and there Christ, with pitying complacency, looking down through the ages, the ever-present "I Am," carrying then, as when ascending the steep of Calvary's hill, his cross; there was in the dawning cosmos of creation, before the world was born, before the sun gave light and warmth, in the unconscious dark abyss of chaos; in the plan, in the eggs, in the seed,—in the mind of God—

> "Every plant of the field before it was in the earth,
> And every herb of the field before it grew."

Material philosophy explains nothing. This universe is but the outward manifestation of the Eternal Divine, the materialization of his thought, himself revealed in nature.

From a faith, extracted from a higher faith, like that tied up in the eggs and seed, planted in the human heart, will spring the eternal garb of man's immortality.

> "Embryos we must be, till we burst the shell:
> Yon ambient, azure shell, and spring to life—
> The life of gods, aye, transport, and of men."

Plants, like animals, manifest sensibilities, and display the consciousness of pleasure and pain; they wither and fade under a burning sun, and die from heat, cold, or poison.

The sensitive plants shrink at the touch of man, become frightened at loud or uncommon sounds, drooping their leaves, and closing their pistils.

"Consider the lilies of the field, how they grow ;
They toil not, neither do they spin, and yet
I say unto you, that even Solomon in all
His glory was not arrayed like one of these."

Plants sympathize with man, sharing his joys and sorrows ; and I have observed, when men and women were breathless and in tears, watching in suspense, hoping and praying, around the bed when mortality was fluttering with the angels, between earth and eternity — I have observed not alone the lowing of cows, the whining of dogs, the moaning of cats, and distress of birds ; but I have seen foliage hang its leaves, and even droop and die ; they, with the life and love released from its leaden pall, the mortal part laid on the bier, the dead from this prison house of clay let free, kissed the plants they loved, which, responding, died, and together took their immortal flight.

"Yes, I can fancy, in the spring
Of childhood's sunny hours,
That nature's infant Priest and King
Loved to play with flowers.

"In them he saw his Father's face,
All Godhead's varied powers,
And joyed each attribute to trace
In sweet, unconscious flowers.

"In them he found where wisdom hides,
And modest beauty cowers,
And where Omnipotence resides,
And tenderness, in flowers."

Let us now take a comparative view of man and the animals, hastening over the four great divisions of Cuvier,

— vertebræ, articulates, radiates, and mollusks, having shown that a fundamental sameness of structure underlies them all.

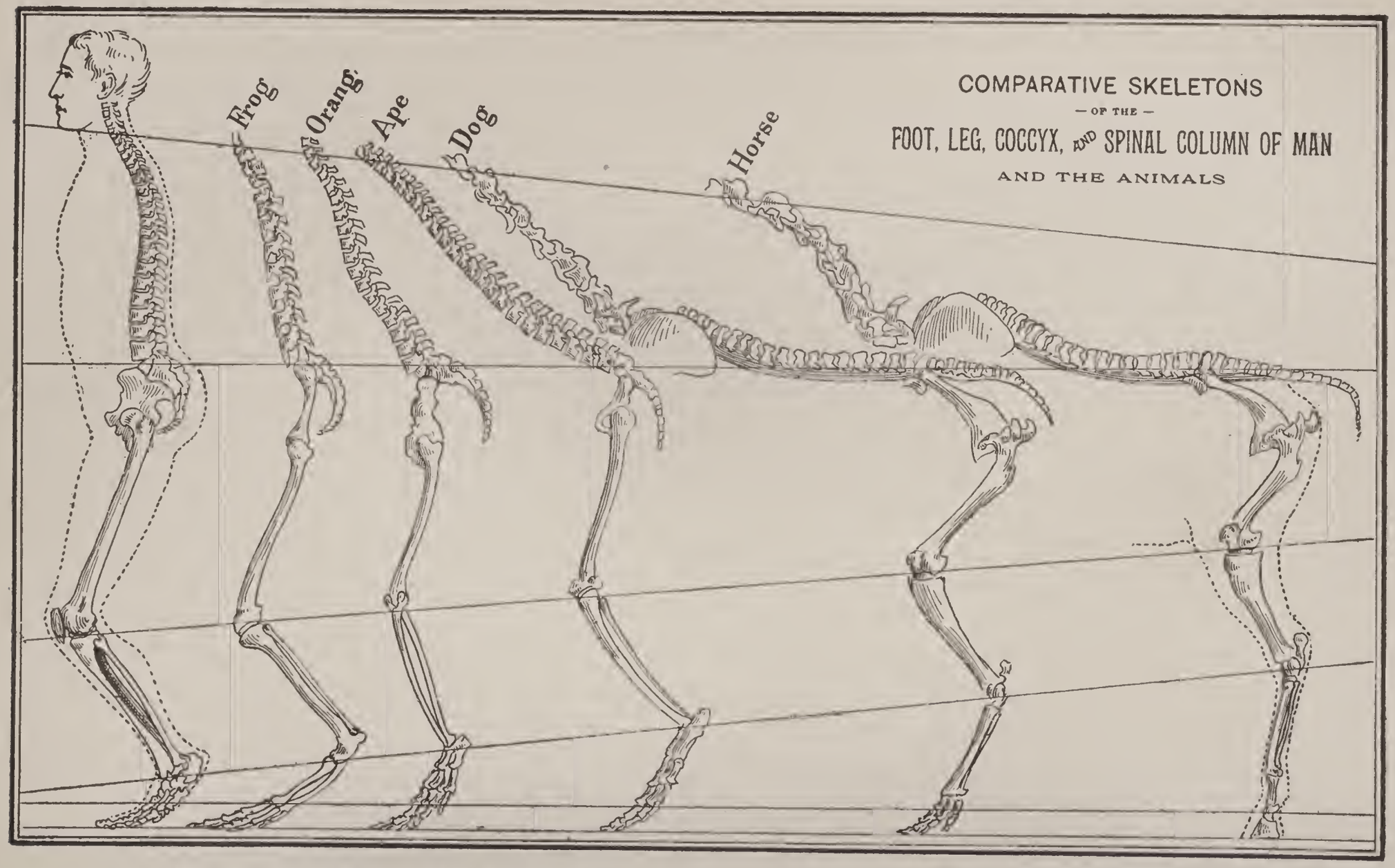
We will take, for comparison, man, the horse which draws his carriage, and the dog which follows; what can be more dissimilar than these? To make the comparison more striking, let us add to the group the orang and frog.

Every one familiar with comparative anatomy, is aware of the fact that there is not a bone, organ, tissue, or nerve in one that is not common to them all; their apparent difference is caused by the comparative different development of separate parts; a particular bone, or part, in one may be very large, while in the other the same bone, or part, may be relatively small.

The tail of the horse and dog has its counterpart in the coccyx of the human skeleton; in the horse and dog the separate joints composing this bone are greatly elongated, while in the human coccyx the same number of bones are flat and compressed into one, known as the sacrum, terminating the spinal column.

The human knee has its counterpart in the stifle joint of the horse, and the human heel has its counterpart in the horse's knee. Each of these joints is surrounded with tissue, muscle, blood-vessels, the exact counterpart of each other. These joints in man and the horse are seemingly very different, but anatomically they are the same. Every separate part in all the forms of life has a counterpart in all the others; and the seemingly great differences are differences only of the development of the parts composing them.

The maxillary, or jaw-bone, of the horse is very large, while the bone in the human head is small and round, causing a very different appearance in the face of



"TO MAKE THE COMPARISON MORE STRIKING, LET US ADD TO THE GROUP THE APE AND FROG." [365]

man and horse. But in the human head the cerebrum or frontal brain is very large, which same in the horse is small. Even the muscles by which the horse moves its ears exist undeveloped in man. The hair which thickly clothes the horse's body has a counterpart in fine short hairs in the human skin.

A unity of plan, pointing to a unity of origin, pervades the whole domain of animal life.

In man all the patterns of utility are combined; it is this that gives him symmetry and beauty, makes him dignified in bearing, and the superior of the whole animal kingdom.

Man's greatest advantage over the animals is in the enormous development of his frontal brain.

The causes which have led up to the varied species in the various developments of parts, have been the varied forces through all the ages.

"It is probable," says Darwin, "that the long neck of the giraffe was developed by severe and repeated drouths or floods, when those only, browsing vegetation from trees, which could reach a few inches above the common herd, survived. This process frequently repeated, developed the long neck." Other animals sought sustenance in other channels, preserving and developing the nose best suited for digging; the claws best suited for climbing; or the claws and tushes best suited for battle.

By taking advantage of the forces of nature, man has modified the whole animal kingdom, and each year he is producing fleeter horses, also heavier and better draught stock.

Man has almost created the present forms of garden vegetation. From wild and useless weeds, he has developed useful roots, fruits, and flowers. This is the

origin of the cabbage and the cauliflower; from a wild and worthless stock, have come all our apples; from a common grass all our cereals.

This world has seen a continuous panorama of varied changes, surrounding all forms of life with new and varied conditions, modifying all the types, and producing numerous species.

The law of co-relation or harmony of parts, changing one part of an organization to harmonize with changes in other parts, has produced its results. Man has become dignified in physique with his advancing intelligence; but he has lost the big nostrils and acute sense of smell which the wild men of Australia still retain; by which means, like fox-hounds, they are notified of an approaching foe. The fur which once clothed his body has disappeared with the dress of civilization, and the hand and foot have become more unique, and his bearing majestic, with the enlarging frontal region of his brain, which is the measure of intelligence and refinement in man.

Nature still presents gradations, in an ascending series of brain-bulbs, from its first beginning in the sensitive plants, through the ascending scale of the animal kingdom, upward to the great brain of man. And in him, gradations from the simpleton and savage, to the massive frontal brain of the highest, best, and noblest men.

Here, in the frontal brain, sit enthroned the faculties of the human soul — reason, imagination, and an acute conscience. Here is the hall and temple of the parliaments of the world, the federations of men. Here, in the frontal brain, man lives the lives of all peoples, and of all races, in all ages. Here, he is a hero with Robespierre in the French Revolution; listens to the philoso-

phy of Socrates, and is a citizen of Egypt in the days of Menes. Here, in the frontal region of the brain, man lives, alike, the past or future; goes back into the antiquities, is a savage with the savages, and in early geologic ages sits upon the cliffs—

"And hears the multitudinous laughter of the sea;"

is present during the fiery turmoil of the earth's early age, and rides the comet of chaos to a rounded world.

Here, in the development of the frontal brain, man feels all crimes and their regrets, all virtues and their rich rewards; he is victim and victor, slave and master, outcast and king; he lives all lives and dies all deaths, explores all heaven, and feels the pangs of every hell.

Here, in the frontal region of the human brain, man climbs the ladder of all thought, weighs the sun, measures the infinite expanse, contemplates all the stars, scales the eternal throne,—

"Rejudges its justice, and is the god of gods"

CHAPTER XXXI.

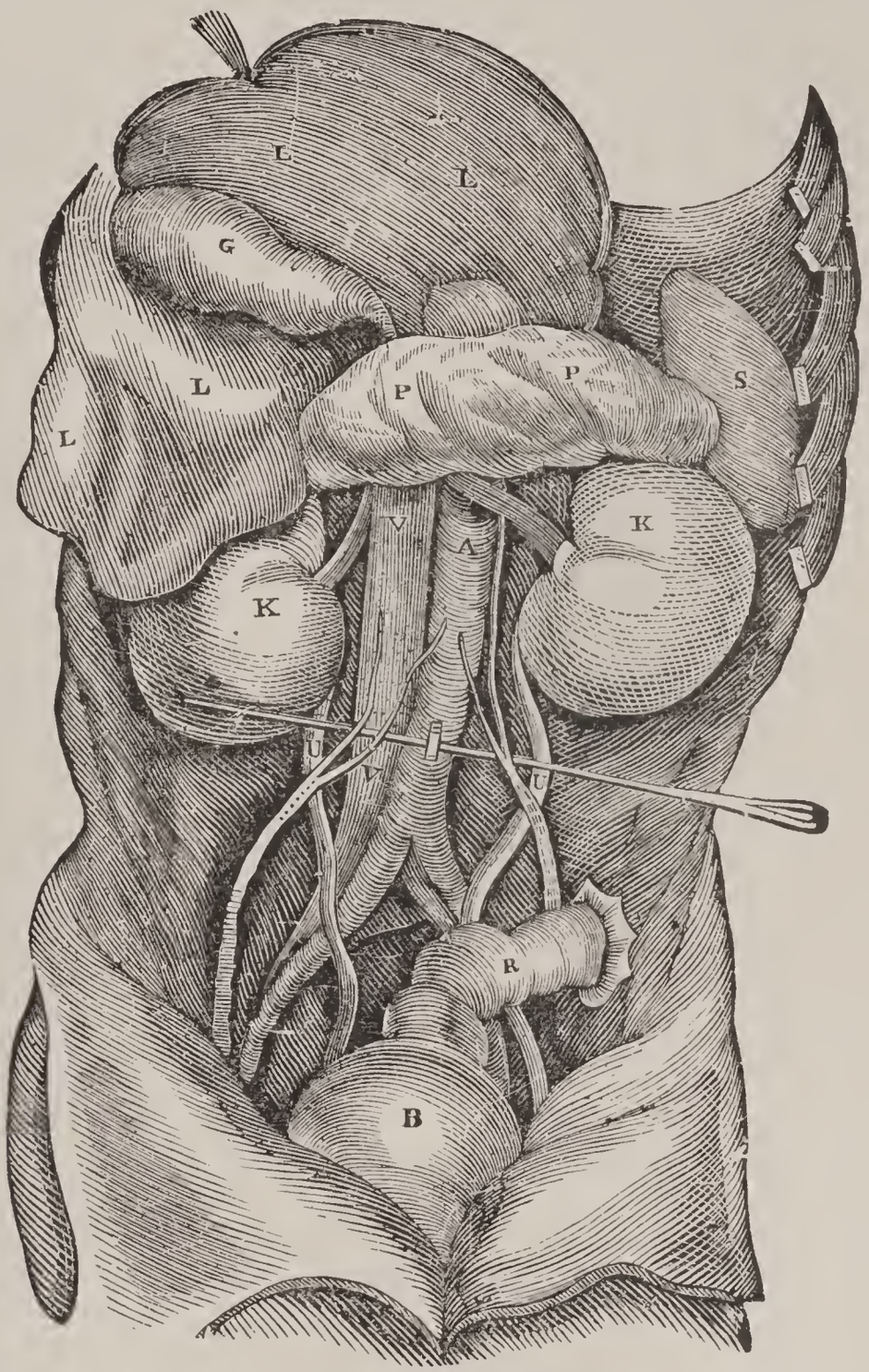
PLASTICITY OF FLESH — ARGUMENTS FROM SURGERY.

False joints sometimes occur in the human organization. Man by accident breaks a limb; from carelessness, or inattention on the part of the surgeon, the fracture is left movable, and a false joint is formed, possessing, in a rudimentary degree, all the essential characteristics of other joints. And instances are on record when such accidental new joints have been transmitted to offspring, by the same law of transmission by which families perpetuate five toes or five fingers.

Plastic surgery is the building, by artificial means, of absolutely new organs or parts. The necessary tissue is sometimes turned or twisted into position from a neighboring locality, thus leaving a blood supply; often, however, the flesh is taken from other parts of the body, and even other persons; and success has attended operations with flesh from other animals, especially that of the chicken and frog.

The ugly deformities of hare-lips are sometimes overcome by the surgical manufacture of absolutely new lips, with flesh generally brought into position from the cheeks or chin.

New noses are frequently made, with flaps turned from the tissue of the forehead or from the arm; and instances are related where a portion of the thumb has been successfully grafted as the base of a new nose. The surgical methods of the manufacture of noses have become



ARGUMENT FROM SURGERY.

so minutely perfected that the surgeon has his patterns for flaps, producing as desired, Roman, Grecian, or other type of noses, with flaps inverted from the forehead.

Cruel as has been the process, monsters have been manufactured, for circus and show purposes, and human babes deformed, and forced to grow out of all resemblance to humanity. Cases of this kind have been discovered by the authorities, and the perpetrators of such crimes brought to justice. And as in all other monstrosities and deformities, hereditary law often transfers them to progeny through long generations.

Certain Indian tribes have had the custom of flattening the heads of offspring by compression, until the tribes have become flat-headed by inheritance.

English and American women are in the habit of constantly shaping the heads of their babies, by the pressure of the hand, materially changing the form. And the head of a baby which is allowed to lie constantly on one side is liable to become obliquely irregular. The simple habit of wiping the nose in one direction turns that organ accordingly.

When tight lacing was the fashion, it was wonderful to see how far the unnatural deformity of the waist was often carried, and the law of hereditary transmission is as true here as elsewhere ; what parents acquire artificially is transmitted permanently.

The little foot of the Chinese, created by tight lacing, has become hereditary in aristocratic circles. Fashion among the early races has undoubtedly had much to do in molding physical contours and shaping the forms of progeny.

Some animals by instinct remove unnecessary parts. It is said that when tails occur among the tailless dogs of

Mexico, the mothers by instinct at once remove them. Such might have been the instinctive custom of African apes and orangs, species of which are tailless. According to Stanley and Livingstone, tails are often met at birth among certain races of low negroes; from shame or natural instinct, however, the mother at once removes them; isolated cases of such monstrosities in men and women have been exhibited in the side-show circuses of this country and of Europe; and the habit of removing tails or any other unnecessary part, by the laws of hereditament after a few generations, dispenses permanently with that part.

Forced deformity by instinct is often practiced in the animal kingdom.

Every worker honey bee is a deformed bee, forced to grow in a cell of given dimensions; the queen, however, is a fully developed female bee. If she is destroyed, the swarm will at once go to work and tear down a worker-cell, containing the larva of a common worker, and build around it a larger queen-cell, allowing the germ to develope its natural size and form, thus manufacturing a queen bee at will. The growers of Italian queen bees take advantage of this principle, and with a small piece of Italian brood-comb, containing a number of cells, in which are the larvæ of Italian bees, raise a corresponding number of Italian queens. This they accomplish by simply placing a separate piece of Italian brood-comb in a separate box, and a handful of common black bees with it; from these germs they raise Italian queens. These queens need but one male contact in a lifetime, and the daily millions of their future eggs are prolific.

It is wonderful how far deformities can be carried in the animal kingdom, and life sustained; young animals

forced to grow in compression have been changed out of all resemblance to their parent form. It is not impossible that the accidental mutilation of animals, in the geologic ages, had something to do in evolving new types and species. Prof. Owen believes that the first appearance of limbs in the reptilian age might have resulted by the accidental displacement of the ribs of fishes, producing at last the limbs of reptiles; developing through a long train of generations, in these dislocated ribs, false joints, and finally perfect joints and limbs.

Every one is familiar with the plasticity of vegetation to physical moldings, transplanting, cultivating, grafting, training, etc. Gardeners often reverse the position of roots, planting the limbs downward, with new and varied results.

By means of grafting, a single tree can be made to yield a thousand varieties of fruit and flower. And the same principle is applied in what is known in surgery as "skin grafting," which consists in the grafting of skin or flesh from other persons or animals into the organization of another being. This is an every-day practice of surgery.

We have already mentioned in another chapter that earth-worms, polyps, and other low forms of life, can be infinitely divided and subdivided, and from each piece a new creation evolved. In like manner, human flesh can not only be molded into almost any form, but its parts divided and sown broadcast upon the granulating surface of wounds, and each individual piece will become the nucleus of growth.

Every intelligent surgeon is familiar with the fact that minute pieces of skin, cut from healthy tissue, and placed upon the surface of a wound, will each take root

and become the center of forming skin tissue. And the epidermis scraped from the cuticle of the surgeon's arm, and thrown broadcast upon a healing sore, will rapidly facilitate the process of healing.

Dermoid tumors have been removed from the ovaries of virgin females, containing perfect and even beautiful sets of human teeth, and whole clusters of perfectly formed human eyes, also locks of hair in nicely arranged curls, and perfectly formed separate organs, bones, and parts, in a strangely clustered conglomerate mass. Wonderful this principle of life blindly struggling to the repetition of the mind and form of the person from whose life it is derived, under impossible conditions! Thomas, Sims, Ramsbotham, and numerous other medical writers, make mention of such wonderful creations, occasionally found in Dermoid tumors.

Disease, wounds, etc., often necessitate the removal, by amputation, of whole organs of the human organizations; all of the extremities — both arms and both legs — have been lopped off, and life sustained; the eyes, nose, ears, and lower jaw all removed, the person still clinging to life. Even portions of the frontal brain have been removed, the spleen and a whole kidney, also parts of the liver, stomach, lungs, etc., and life still sustained.[1]

[1] The following is taken from the Eau Claire "Times," Aug. 3, 1887: "Dr. W. E. Jurden on Tuesday of last week performed one of the most difficult and dangerous operations in surgery on Mr. John Medley, of Drywood, who has been an invalid for a year, and confined to his bed for the last six months. The patient was put under chloroform, and then Dr. Jurden began cutting through vital parts, where the slightest deviation of the knife would cause certain death, and opening the bladder at the proper place, surgical forceps were inserted, and a calcareous tumor removed, after which the ulcerated bladder was washed with tepid water. The stone when taken out weighed five ounces, and was as large as a hen's egg. Mr. Medley made a splendid recovery."

In the growth and development of all forms of life, strange results sometimes follow from compression, disease, or other abnormal circumstances affecting the embryo.

In the dissection, at St. Louis, of a man with three legs, the extra limb proceeded from the back, and there was found the whole undeveloped outline of another person — his twin brother — forming a tumor under the skin; every part of his organization had been dwarfed, except the one leg, which received its nourishment through the blood supply of his brother, whose more perfect existence enveloped him. Such mingling and growing together of two or more organizations in embryo, with arrested development of parts, are of common occurrence; and no circus is complete without a number of such monstrosities.

The external human tissue can be made to take the place and assume the functions of the alimentary canal; and man and the animals have been nourished for long periods by means of the absorbents of the skin. The intelligent surgeon often takes advantage of this principle, and sustains life for long periods when, from abscesses and other causes, the stomach and alimentary canal are rendered powerless to receive and absorb nourishment.

The following is taken from the Eau Claire "Free Press," 1880: "Dr. Jurden has established a reputation as a practitioner of extraordinary merit, experience, and skill. His success has been positive, and his office has been visited by as many as one hundred patients in a single day. But few physicians have had the experience of Dr. Jurden, and no one in the county has been more uniformly successful."

The following is taken from the Eau Claire "Leader," August, 1884: "It is idle to speak of Dr. Jurden's well-merited success; his name has become a household word, and an army of patients in the city and elsewhere, who have found relief under his treatment, are monuments of his ability and skill."

The external administrations of medicine through the absorbents of the skin, are to-day coming more or less into vogue by well-informed physicians.

Upon the surgical removal of one organ, another at once commences development, supplying its place and performing its functions, and I have seen armless men who could write, eat, and use their feet as dexterously as we use our hands.

The human eye shapes itself to one's avocation or business. The pupils become permanently dilated in sailors and other persons accustomed to long-distance observations; but the pupils of sewing women, microscopists, book-keepers, readers, etc., contract accordingly. And I have repeatedly met men and women with one large and one small pupil, and watched their motions as they unconsciously employed the microscopic eye for close observation, and the other, or telescopic eye, for long-distance observations.

In the born blind, the nerve-bulbs on the fingers enlarge, and become exquisitely susceptible to forms, sizes, hardness, and even color, taking almost the place of human eye-sight. It would follow, perhaps, if through a long train of generations some inherent disease should destroy the eyes of the fetal child, that compensatory nerve-bulbs would enlarge on the fingers, becoming more sensitive with each generation until rudimentary eyes on the tips of the fingers might result, the same as with the fish of the Mammoth Cave, which exhibit no trace of eyes, but which by continued breeding in sunlight, soon develop perfectly formed eyes. By the force of this law, some of the spiders, radiates, and star-fishes have hundreds and even millions of eyes, radiating from the sur-

face of their bodies, sometimes on separate stems, as if to make room for the innumerable clusters of their extended eyes.

Reason tells us that if numerous gradations, from a simple nerve-bulb to an eye complex and perfect can be shown to exist in nature, as is certainly the case; if, further, the eye ever varies, and the variations be inherited, as is likewise certainly the case; then the conclusion logically follows that perfect and complex eyes would result from natural selection through the long ages of life on the globe.

How a nerve-bulb came to be sensitive to light, involves the same question as the origin of life itself. In searching for the gradations through which an organ has been perfected, we are forced to look to other species, in order to see what gradations are possible.

The simplest organ which can be called an eye consists of an optic nerve, surrounded by pigment cells, without any lens, or other refractive body. Eyes of this simple nature are not capable of vision, and only serve to distinguish light from darkness.

In certain star-fishes the pigment which surrounds the optic nerve is filled with transparent matter, projecting with a convex surface, like the cornea of the higher animals; in this we observe the first step towards the formation of a true picture-forming eye.

In the vertebrate kingdom, we can start from an eye so simple that it consists, as in the lancelet, of a little sac of transparent skin, furnished with a nerve, and lined with pigment. In fishes and reptiles the structure of optical gradations is very great.

Even in the human embryo the beautiful crystalline

lens is formed by an accumulation of epidermic cells, lying in sac-like folds of the skin ; and the vitreous body is formed from subcutaneous tissue.

We know that the telescope has been perfected by the long-continued efforts of human intelligence, and we infer that the eye has been formed by an analogous process ; nature always watching each slight improvement, and carefully preserving it ; generations after generations multiplying infinitely with natural selection, or the survival of the fittest constantly picking out each improvement. With this process going on through millions of years, in millions of individuals of many kinds, may we not believe that nature will at last perfect a living optical instrument, as much superior to the artificial ones of glass, which man has made in the microscope and telescope, as the works of the Creator are superior to those of man ?

What we have said in reference to the eye applies to each and every organ of the human body ; they all present somewhere in nature gradations from the crudest beginning to the most perfect ; even to the brain of man, which descends with steady gradations through the animal kingdom until it disappears in the sensitive plants.

And the history of the evolution and development of the separate organs of the human body, corresponds with the history of the evolutions of life itself on the globe.

When the nerve-bulbs of the forehead had attained sensibility and got ahead of other nerve-bulbs in the race for light, the struggle for supremacy would no longer be contested by other nerves, and the line of development would therefore become established in those two nerves, perfecting at last the eye in the place where we now behold it.

The human eye and ear, as they now exist, are but the miniature of the possibilities of future development.

So, also, of the human brain : its present development is but the dawn of future possibilities. We observe constantly new unfoldings in the human brain evolving such wonderful creations as Shakespeare, Blackstone, Fulton, Edison, and others, prophesying still new and greater developments in the brain of man. We are but initial types, the dim dawn of an intelligence and civilization yet to come.

I have written this chapter to show the plasticity of life under the influence of environments, to show how living beings have been transformed by surrounding conditions, through all the long ages since life first made its appearance on the globe.

When we consider the countless changes and varied forces which have acted upon life through the ages, it is only surprising that the species are not more numerous than they are, and that nature has not reached an ideal of perfection even higher than the present human eye, ear, hand, or brain.

This human flesh differs in no manner from the flesh of all forms of life. The chemical elements of our bodies are precisely like the chemical elements which surround us, constituting air, water, earth, and rock.

Man rises above crude inorganic matter, rises above nature, rises above flesh in his complicated organization. with its massive brain wherein he becomes the recipient of thought, volition, feeling, and emotion. Here he receives and reflects the divine image.

> "He that soweth to the flesh shall reap corruption,
> But he that soweth to the spirit, life everlasting."

CHAPTER XXXII.

ANTE-NATAL INFLUENCES — THE HUMAN EMBRYO ENVIRONED BY THE ENVIRONMENTS OF PARENTAGE — BIRTH-MARKS APPLIED TO EVOLUTION.

The influences which surround the mother during the period of gestation, fore-ordain and determine the character of her offspring.

The thought tied up in surrounding nature is reflected in the mind and contour of the child. This law reigns supreme, and mental impressions on the part of parentage transmit to progeny the physical and mental embodiments of such impressions. We read that —

> "Jacob took him rods of green poplar, and
> Of the hazel and chestnut tree, and peeled
> White streaks in them, and made the white appear.
> And he set the rods which he had peeled
> Before the flocks; and the flocks conceived
> Before the rods, and brought forth cattle
> Ringstreaked, speckled, and spotted."

Under the force of this law, the birds and animals of the extreme north, surrounded with a snow-covered landscape, have become clothed with a milk-white fur; even the seals derive their beautiful colors from the water and earth beneath the ice and on the rocks where they conceive.

The grotesque and picturesque, the sublime and beautiful, all the varied forms of nature awakening

"Mothers Gave Birth to Children Resembling the Gods, Before Whom They Knelt and Prayed." [383]

various emotions on the part of the mother, have their influence in modifying and molding the type of all life.

A vine about the doorway of the most humble cottage, flowers in the windows, and the garden tastily arranged with walks, shrubbery, and made the objects of attention and care, as well as the more costly splendors of homes decorated with carpets, sculpture, paintings, or otherwise made beautiful; whatever calls out taste, ideality, and admiration of the refined, lovable, and lovely in parentage, not alone makes the children lovers of the sublime and beautiful, but even beautiful in face, form, and figure.

And this applies to whatever in nature is distorted and ugly. In homes whether of poverty or wealth, whether a millionaire's or the poor man's cabin; disharmony and discord, whatever excites selfishness, avarice, fear, or baser passions in human nature, is embodied in the offspring of the parentage of such homes and surroundings.

It is well known that a mother sometimes gives birth to children resembling objects which she saw in fright, or over which she became ecstatic with delight, and children have been born affected by a mother's fright from drunken men, who have reeled like drunkards all their lives.

Every city should pass a law prohibiting merchants from publicly displaying grotesque, ugly, and ill-formed statues, because of their power through the mind of the mother to deform offspring.

A case came under the writer's observation where the face of the child was as ugly as the loathsome and diseased face that impressed the mother. Another young

mother gave birth to a child the exact pattern of a beautiful doll which she had admired and fondled.

Cases are frequent where children resemble doctors, ministers, lawyers, and other men not their fathers, for whom the mother had an intense admiration, with his form and image constantly in her thoughts.

The Romans and Grecians came to possess facial contour and bodily forms resembling their sculptured gods, before which their women knelt and prayed. The facial outlines of the Grecian deities were all fashioned after one classic plan, with the straight or monumental nose, and the force of this law gave to the race its characteristic feature. This was also true of the Romans ; they made the noses of their gods more prominent, especially in the central arch, at last making this nose the type of the race.

The workings of this law present us every day with strange and peculiar results, and we meet persons who exhibit what are called "birthmarks," perfect pictures, as if painted or molded on the human form, of strawberries, roses, mice, and other strange protuberances and colors.

That this law has had an influence, through all the ages, in molding the types of life, cannot be questioned ; it has a bearing upon the highest and most sublime mental characteristics of nations and individual geniuses.

It is said that the mother of Dante saw in imagination the wonderful pantomimic scenery which is so sublimely embodied in the writings of her son. The mother of Ezra Coleburn is said to have been occupied during the winter prior to his birth in the study of mathematics, conferring the wonderful traits afterwards exhibited in her son.

Again: a mother, whose husband was a soldier, became imbued with an irresistible passion to behold conquest and victory, following her husband in the camps and march of war, studying its plans, and filled with the fire of military enthusiasm; she became the mother of the man whose name, so great in history, was Napoleon.

Thus mental characteristics of individuals and of nations, also of the instincts and habits of animals, have been more or less derived from transient, emotional characteristics of parentage. And talents which parents possess in a lesser or transient degree, have been permanently embodied in their progeny, in a higher and more enduring form.

Nature has been struggling through all the ages towards the mirage of itself, in the production of a being that is the antitype and reflection of all its environments.

In other words, this universe, with all of its complicated varied phenomena, in which God clothes his existence and manifests his attributes, is struggling to repeat itself, not alone in the dignified bearing and divine form, but in the grander mental, moral, and immortal characteristics of human thought and human love.

The character of the mind and soul of humanity, with good or evil stamped in the heart of every individual during the evolutions of this earthly life, are marks on embryos, that will deform or beautify man's fuller and eternal existence.

CHAPTER XXXIII.

ARGUMENT FROM THE BRAIN — PHRENOLOGY.

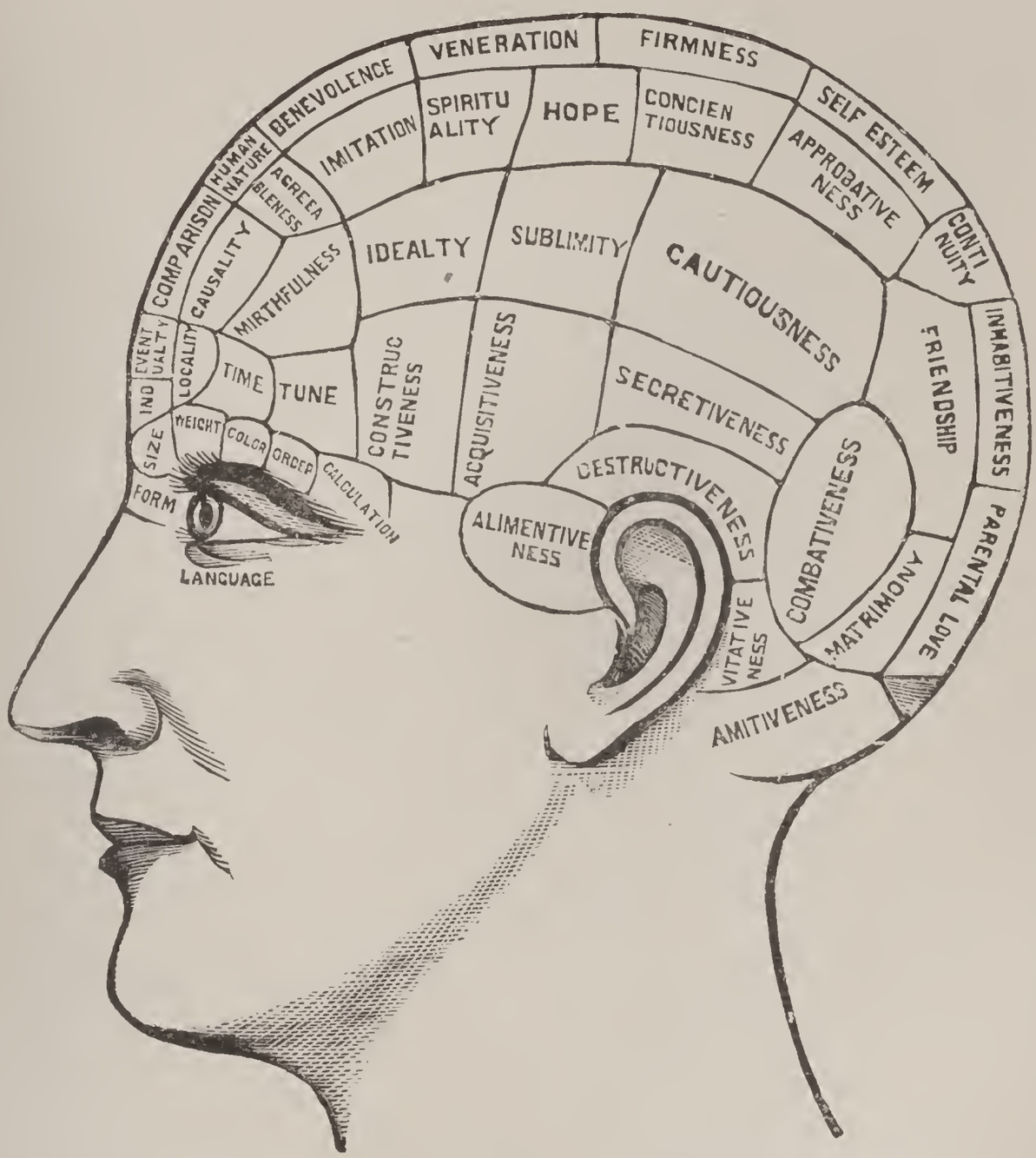
If this book was one of biography, and I was going to pay tribute to men, I should do it to the discriminative and practical understandings manifest in the writings of Gall, Spurzheim, and Combe; to the bold but true, loving spirits of these great fathers of a new science.

These men have clearly demonstrated that the brain is the organ of the mind, and that it is composed of parts, having each a separate office to perform; that one portion of the brain evolves will, another reason, another perception, another sympathy, and yet others mechanics, mathematics, affection, music, veneration, etc.

Tyndall goes further, and remarks in substance, that mental processes are the result of the agitation of brain fiber; that every separate fiber produces a distinct kind of thought or feeling.

The separate organs of the brain, therefore, run into each other by an insensible gradation, just as thought and feeling present every degree and phase of manifestation, running into each other by an imperceptible blending. And yet each separate portion of the brain has for its office the production of different passions, emotions, sentiments, etc.

Size, other things being equal, is a measure of power. By knowing, therefore, the location and office of the separate parts of the brain, the measure of the force and na-



"The General Grouping of the Phrenological Organs Are, I Think, Well Established."

tive capacity of an individual may be determined, and the latent talents, propensities, and natural instincts of a man may be measured by the measure of that portion of the brain which produces them.

It has been demonstrated that the perceptive faculties, or the faculties of observation and quick judgment of forms, sizes, colors, weights, measurements, and figures, occupy the lower frontal region of the brain.

The meditative faculties, consisting of the power to reason, analyze, compare, and imagine, occupy the middle frontal region of the brain. The religious and benevolent faculties occupy the upper frontal portion of the brain. The self-controlling powers, or faculties of dignity and resolution, occupy the upper posterior portion of the brain. The loves and affections are located in the posterior basilar portions of the brain. The executive propensities, or propelling forces, occupy the central basilar regions of the brain, widening the head when large at and behind the ears.

The general groupings of the phrenological organs are, I think, well established. The *minutia* of the system, as taught by Fowler, dividing the brain into minute parts, and locating the little idiosyncrasies of character, is far from being demonstrated. And should the little details of the system be proven hereafter to be true, phrenology can in no way become a practicable art, since the very thicknesses and protuberances of the skull, together with the uncertainty of the education and culture of a particular organ, would necessarily lead to what we have so often witnessed in itinerant phrenologists,— bumpology, quackology, and flatterology.

Animals with largely developed cerebellums, or wide, full back-heads, have fierce passions, sexual im-

pulses, and love of offspring ; and in proportion as their foreheads are deficient, is observed the lack of intelligence. It is therefore a logical deduction that the base of the brain, or cerebellum, is devoted to the passions and propensities.

The development in man of this portion of the brain differs greatly. A wide, thick-neck, broad and deep back-head, is recognized at once as the head of courage, terrible passions, and physical endurance. The bear, lion, tiger, etc., are broad across the back and base of the skull, the shape of their heads conforming to their dispositions, while the heads of the rabbit, sheep, horse, etc., are narrow in this region, differing, however, in different individuals ; hence the various degrees of docility in these animals.

The characteristic head of the pugilist is low, round, and wide, with a thick, bull-neck ; while people of an opposite disposition, cowardly, timid, lacking force, nerve. and energy, and of sickly constitutions, have relatively narrow heads in this region.

In animals, the frontal portion of the cerebrum, or forehead, is low, and never extends outward, overhanging the eyes ; but in man this portion of the brain projects forward over the eyes, rises up square and broad ; and in exact ratio to its development, becomes the possibility of education, and the acquisition of general intelligence.

A long head, projecting forward in front of the ears, broad and high, is proverbial for wisdom.

The enormous development of man's cerebrum, or frontal brain, carries him far above the animals in intellectuality, reason, and imagination. And still above this, in man, is found a region of brain which, in the animals, exists only in embryo. And in exact proportion to the

height, width, and size of the upper frontal region of the brain, rises the scale of man's moral and religious nature.

The height and width of the back-head is the measure of will, self-reliance, and conscientiousness.

The width of the forehead in front of the ears, through the temples, and above the eyes, is the measure of music, mathematics, mechanical ingenuity, trade arrangement, taste, and love of the beautiful.

The human brain is much larger in proportion to its size than that of any of the animals, especially in the frontal region — the region of the intellectual faculties.

We see here, as elsewhere, that man differs from the animals only in development.

No study more beautifully illustrates the principles by which nature has struggled upward through the ages, to higher mental positions and larger brains, than phrenology.

Nature still presents her gradations, in a steadily ascending series, commencing with a trace of a nervous system in the sensitive plants, through its ascending development in the animal kingdom, upward to the great brain of man; and in him presents countless varieties and gradations, corresponding with his varied characteristics and mental and moral traits.

Phrenology has been objected to on the ground that it leads to materialism, and the annihilation of the mind at death; such is the first superficial inference; but on deeper reflection, we reach a contrary conclusion.

In the same manner as the eye only receives the light and impressions from without, and its development and perfection is the measure of capacity; or, as the ear is but the *receptaculum* of intonations, and its develop-

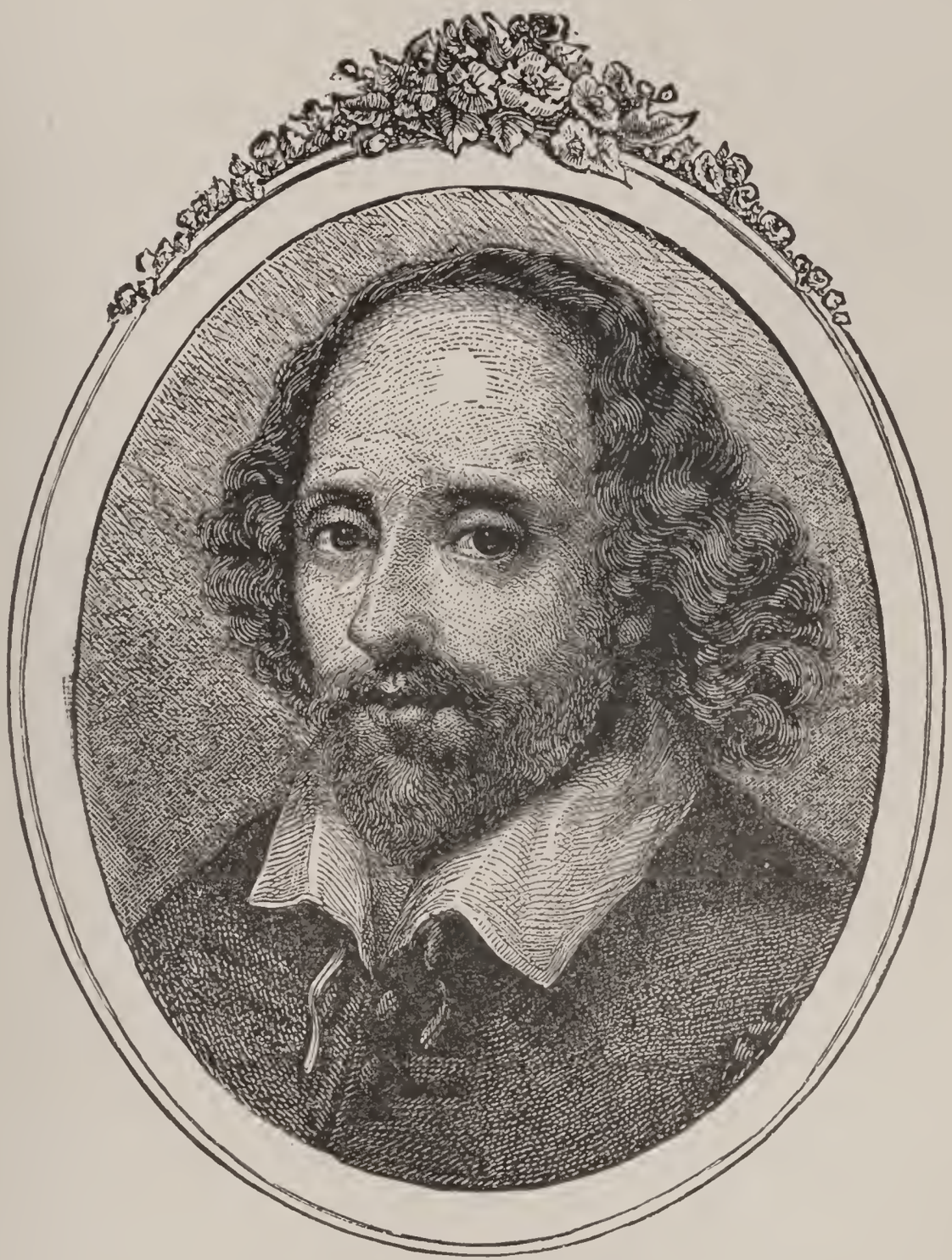
ment or perfection is the measure of capacity; or, as the various senses of smell, touch, and taste depend on the development and perfection of certain portions of the brain, the development and perfection of which is the measure of capacity; so, likewise, the separate organs of the brain are but the receptacles of sensation, thought, and feeling from without.

In the brain, with the varied organs, like measures of varied sizes, man receives the consciousness of that which exists without and around him, in this stupendous universe; receives, in short, the eternal thought of God, manifested in the varied phenomena of nature, reflecting varied sensations and feelings.

The brain, with its separate parts, does not create thought, any more than the eye is the creator of what it beholds, or the ear the creator of intonations or sounds.

The human brain, therefore, is the *receptaculum* of God; and phrenology is the measure of individual capacities, in the reception and indwelling of the divine nature and essence. The brain receives and reflects that which is divine and eternal, and the development of its organs is the measure of the divine in man.

The eye may crumble into dust, but the universe remains; the brain may fall away, and e'en to sense become a vanquished shadow; but thought and feeling, emotion and sentiment, in short, the soul of man, will continue to live with God among the stars.



WILLIAM SHAKESPEARE.

"The Face is as a Book Where Men May Read Strange Matters."

CHAPTER XXXIV.

ARGUMENT FROM THE HUMAN FACE AND FORM — PHYSIOGNOMY.

"Tell me by what hidden magic
Our impressions first are led
Into liking or disliking,
Oft before a word is said.

"Why should smiles ofttimes repel us,
Bright eyes turn our feeling cold;
What is that which comes to tell us
All that glitters is not gold?

"Is it instinct, is it nature,
Or some freak or faulty chance
That our likings or dislikings
Limit to a single glance?

"Is it? Pray will no one tell me,
No one show sufficient cause
Why our liking and disliking
Have their own instinctive laws?"

Even as man is related to the animal kingdom, having been evolved out of it, both as regards his descent in the geologic ages, and also as regards his individual embryonic development, he still retains more or less the resemblance of his ancestral pedigree, and consequent relationship to various animals.

And as in looks and appearances, so in character; even as men resemble various animals, so also a sameness in their natures.

Some men look like lions, others like bull dogs, some have the face of a hog, others the hawk-nose and piercing eye of the eagle; some men look like hounds, others like ducks, while many resemble, as we have shown in former chapters, monkeys, orangs, and chimpanzees. And as in looks and appearances, so in character: almost every day we meet men who present striking likenesses to various animals; if we study them closely, we will discover that the sameness is continued in their manner, habits, disposition, and characteristics.

The lowest and most loathsome of the animal kingdom, the snakes, writhe their poisonous forms on their faces, upon the earth, and at our feet; animals higher, and midway to man, walk on all fours, while man himself stands erect; at once we behold in his dignified bearing and heavenward glance a lofty nature.

The angle of gradation, from a horizontal to a perpendicular,[1] rises in successive degrees through the whole animal kingdom, from the worms and reptiles to the divine form of man.

This principle has an application to the head and face. Beings of the lowest mental make-up present a face nearly horizontal, while in animals slightly higher, the line is raised to an incline plane. This line continues to ascend in the face and head, in the successive upward steps in the animal kingdom, until it becomes a perpendicular in the great men and geniuses of our time.

Applying this principle to the human face, as presented by various individuals, we observe a great difference or deviation from an incline plane to a perpendicular; and as this line ascends, likewise ascends the mental, moral, and divine characteristics of a man.

[1] See picture of man and the animals.

THE FACIAL ANGLE. (See Opposite Page.)

Thus a line from the under jaw to the forehead of the snakes and reptiles is almost flat; this line rises by successive degrees in the animal kingdom, and in the horse it produces an incline plane of about forty-five degrees; and the line still ascends through various animals, being considerably higher in monkeys, orangs, and still higher in idiots and savages; rising in each individual with the increasing degree of his intelligence, until it becomes a perpendicular, touching the chin and forehead of the greatest and best men.

"The countenance of the wise showeth wisdom;
But the eyes of the fool are in the ends of the earth."

A high forehead is proverbial for kindness and sympathy. A high, broad, square forehead, with prominent corners, is noted for intelligence, mirth, and politeness. A high middle head is indicative of a religious nature. A long head and square forehead, with great depth, projecting forward from the ear, and overhanging the eyes, is proverbial for sense and good judgment. A high back head indicates self-esteem and self-control. A low, wide head and thick neck are characteristic of the ferocious, affectionate, and powerful animals, and is the characteristic head of fighters.

Napoleon chose big-nosed men for his generals. The larger the nose, the more there is of character.

The Grecian straight or sculptured nose was the nose of a people distinguished for scholarship, refinement, and art; so likewise, when you find it in individuals of any race, it means scholarship.

The Roman hawked and prominent nose was the nose of a people characterized for warlike aggressive-

ness ; it is the nose of success, force, and will rule or ruin, wherever found.

The Jewish nose, hawked, prominent, and wide in its lower portions, characterizes a people noted for their trading qualities and financial abilities ; it is the nose of barter and sale, speculation and accumulation wherever found.

The aquiline or concave nose is the nose of female beauty, and what we admire in women, a lack of combativeness and force.

The snub nose is still more indicative of a lack of character, and is characteristic of boasting, bickering, and fault-finding.

The inquisitive nose is long, and projects straight outward from the face, as if made for the purpose of prying, eternally, into somebody's business.

The apprehensive nose is long, and projects straight downward over the mouth, and characterizes a mind turned downward to worldly thoughts and forebodings of evil. These noses are found variously combined in individuals, and so in character.

Mirthfulness turns up the corners of the mouth, while sorrow and sadness draw them downward ; one can sometimes read pages of sorrow or mirth in the secret history of a friend, by the changed aspect of this feature, alone.

A deep, perpendicular line between the eyebrows, in the forehead, indicates developed thought and a sense of justice. When Lincoln took the presidential chair, this line was not prominent, but after six years of perplexing discriminations, here as elsewhere in his face, a deep line was carved.

Transverse lines outward from the mouth denote hospitality and a humane spirit.

VON HUMBOLDT.

Dimples in the cheeks, chin, or elsewhere denote extreme sensitiveness to pain and pleasure.

High and broad cheek-bones, below the temples, are indicative of self-reliance and sympathy ; it is the sign of a good nurse, motherly devotion, and the natural doctor.

Horizontal lines across the forehead and about the eyes, denote experience and hard study, worriment and perplexity, a life that has seen shadows with successes.

A straight, stiff upper lip, indicates unyielding firmness ; hence the expression, "Keep a stiff upper lip."

Mouth and jaws, projecting outward, indicate good digestion, with animal propensities ; accompanied with thick lips, as in the negro, brutality, passion, and coarseness of character. Mouth and teeth inclined inward indicate deficient vitality, lack of force ; and with thin lips, extreme delicacy and sensitiveness.

The forward projection of the chin is the measure of the loves and affections, and always corresponds with the development of the back head.

A long or downward extending chin, is the measure of self-control. A broad chin indicates stability, a sharp chin, intensity.

"Let the blue eyes tell of love, the black of beauty ;
But the grey soars far above, radiant in the realms of duty.
Sing then of the blue eyes love, the black of beauty,
But the grey we will crown above, radiant in the realms of duty."

A large, open eye indicates credulity and confidence ; while reserve, suspicion, and cunning partially close the lids. Large pupils denote expanded projects, confidence, and imagination ; while small pupils, close observation and analysis. In proportion as the mind is flexible, the

pupil of the eye dilates and expands under the influence of varied emotions. A command of words, or gift of gab, with or without great intelligence, forces the eye forward and outward, creating what has been called the "bag eye." Butler and Beecher, with their great minds back of a command of words, are good illustrations.

Faces come to resemble and indicate the very avocations in life which persons follow; and ministers, lawyers, doctors, politicians, editors, merchants, mechanics, soldiers, sailors, miners, and laboring men, can generally be recognized, at a glance, by the practical physiognomist.

The human face, like a book, contains in hieroglyphics the history of a life. Its form changes with every vice or virtue, with every sinful passion, every kindness and sympathy; the acts and thoughts of a life are here embodied, so that all who run may read.

"An artist wished to paint a face,
The symbol of innocence and joy.
He took a child for his ideal,
And drew the likeness of a boy.

"Long years passed on; the artist now,
A gray old man, one picture more
Designed to make; and called it "guilt"—
A contrast of the child of yore.

"He went into a prison dark,
Its cold walls damp with slime,
And painted a wretched man chained there,
Condemned to death for crime.

"Beside the first he placed the last,
And when he learned the prisoner's name,
He found the laughing, innocent child,
And hardened man were but the same."

All things are what they seem to be; and so in human nature, men are what they seem. Appearances are sometimes said to be deceitful; but we have only to examine the thing more closely, when it will appear to be just what it is. If a wicked knave tries to appear honest and in part succeeds, it is because he understands the appearance of honesty, and tries to imitate it; the counterfeit, however, is superficial, and cannot deceive the close observer.

The human voice is in exact accord with character; and its intonations and sounds not only differ in individuals, but fluctuate in the play of the various passions. The elocutionist strives to imitate the natural language of the passions, and the orotund, guttural, aspirate, tremor, and other tones excite within us hatred, sublimity, revenge, fear, wonder, affection, reverence, mercy, etc. Even the intonations or sounds produce these effects unaccompanied with words; hence the fundamental trait of character is at once recognized in a person's voice.

Instinctively we all understand the language of animals and the meaning of their voices, even if we do not know their natures; the roar of the lion, the growl of the hyena, the bark of the dog, the mew of the cat, the chatter of the squirrel, or the song of birds.

The walk also indicates character; slyness or secretiveness walks on the toes, firmness on the heel; self-importance throws the head backward, and walks with the characteristic strutting air.

We have seen that man rises above the animals, and out of the animals in every department we have studied; we find that his superiority over the animals consists alone in a higher development, especially of the frontal region of the brain, where God himself sits enthroned.

CHAPTER XXXV.

SOCIOLOGY — A MOTHER'S LOVE — CHILDREN — EARLY INFLUENCES.

We come now to the study of children, the flotsam and jetsam on the rude sea of life. How I love you, lamb-like flocks of little things!

"Yours is the sunny dimple,
Radiant with untutored smiles;
Yours the heart serene and simple,
All unwarped with selfish wiles.

"On your dimpled, sunny faces,
There are no deep lines of sin,
None of passion's dreary traces,
That betray the wounds within."

Let us trace the child in its varied surroundings, in the influences which act upon it, for good or evil; in its wanderings, surrounded by the winds and waves of temptation, perhaps dashed on the shoals of dishonor and crime; or perchance surrounded with kindlier influences, impressed by daily lessons, and stamped with all the markings of a noble nature, reared into manhood and womanhood; the embodiments of virtue, purity, self-sacrificing benevolence, piety, wisdom, and made the light and strength of society.

Dickens has well shown, in his "Oliver Twist," that inherent nobility and goodness will sometimes survive the force of evil example and evil surroundings, amid

"WE COME NOW TO THE STUDY OF CHILDREN."

vile associations, classed with its companionship under the bane of vice; receiving alike the condemnation of society, and the enticing glare from dens of sin; withstanding the force of circumstances, seemingly strong enough to drag angels down, and flashing out, even in childhood, like fire-fly reflections in darkness, its inborn nature and nobility; emerging at last into manhood's sun, with principles fixed in virtue, and a life emitting godlike splendor.

And we see marked examples of blood and pedigree, showing its supremacy; pursuing, untainted, the paths of virtue; coming into manhood honorable members of society, even though that child be the adopted charge of villains and vagabonds.

And cases are not uncommon when children of vile and low pedigree, with inherent evil propensities, have been adopted into the homes, and surrounded by precept and example of the highest and most sterling character; but contrary to all these influences, become essentially chips of the old block, with the passions and propensities of their parents.

A certain family in New York City has been traced through ten generations, from its beginning in a professional thief, prostitute, and murderer. Among the members of that family, fourteen have been hung, forty-two have received life sentences in the penitentiary; its female members have been mainly women of the town, and there has been found in the entire family scarcely a redeeming example; such is the force of hereditary law and early influence.

Although hereditary qualities are inborn, influences are a powerful factor in molding the character of childhood, and therefore of manhood.

In illustration of some of the causes which act upon childhood for good or bad, we will take two brothers, alike in character and disposition, and suppose them reared by persons not their parents. One has the protection and care of kind, affectionate, Christian people, who love and educate their little charge; on putting him to bed, his guardian mother tucks down his covers, hears his little prayer, and kisses him with a loving "good-night." He lives surrounded with no lessons of hypocrisy, which even the quick perception of a child distinguishes at a glance, but surrounded with daily life and example of all that is noble in father and mother. He beholds the happiness resulting from virtue, and the success of honesty, while elsewhere he beholds unhappiness, pain, and sorrow following the false and selfish, the dishonest and sinful. He learns that honesty is the best policy, that it receives confidence and success in business, that it ripens into an honored age, serene in life and radiant in death.

This boy is met on rising in the morning with a pleasant, "Good morning, my dear; did you sleep well last night?" "O yes, thank you, mamma; and I dreamed of you, and of the school, and of the teacher, and I was so happy." He is growing into manhood.

His less fortunate brother is reared in a family of cross and ill-tempered vagabonds, who cuff and kick him about, box his ears, call him a dirty blockhead and a dunce, and send him to bed with malice and hatred in his heart. He is long crying himself to sleep; his little head aches between and behind the ears, where the blood goes all night long inflaming his passions, while his better nature lies dormant and unexercised.

These children are forming characters. Can we suppose that the first-mentioned will not be a grander man, and a better member of society than his less fortunate brother, when he comes into manhood?

How powerful for good or evil is the influence of a mother during the hours passed in unavoidable seclusion; when the affections and mental principles of her child can be molded into almost any form by the plastic hand of maternal love.

"The mother, in her office, holds the key of the soul;
She it is who stamps the coin of character,
And makes the being, who would be a savage,
But for her gentle cares, a Christian man."

What worlds of meaning and of memory are tied up in the one word "mother;" coming back to us, e'en in grey-headed manhood. Yes, pleasing memories halo the word; it was the first name my own baby lips learned to lisp; it was the first love my boyish heart ever knew.

"And gentle words that mother would give.
To fit me to die, and teach me to live.
She told me shame would never betide.
With truth for my creed and God for my guide.
Years rolled on; but the last one sped —
My idol was shattered; my earth-star fled."

And when angels took her to their home, her loss was the first great sorrow my young heart had ever felt, making me to understand a part of the meaning contained, and lost, in the one word "mother." I fain would dwell upon the pleasing reminiscences of her individual life.

But my subject deals, rather, with the word "mother" in its broad bearings upon humanity; its love as affecting

the world's heart; its teachings as affecting the world's character; its influence as affecting the world's destiny.

"God is love;" this is the sublime declaration of inspired sages, the conclusion of reason, and the impulsive self-prolonged song of the human heart.

And his creatures get near him in essence, becoming divine, in proportion as they are filled with its force and guided by its dictates. Pure love, true love — the dream of youth, the cherished reminiscence of age, the poet's song, the flower of holiest sentiments, the source of all inspiration, the fire of prophecy, of heroic, divine philanthropy, once embodied, and shining still from Calvary's hill!

That life which is devoid of love is incomplete, unsatisfactory, sterile; nature in anger blots it out, and it passes like the shadow of a cloud.

Love to a man, at best, is but an episode; to a woman, the embodiment and history of her life. A thousand distractions divert man: fame, riches, power, pleasure, all battle in his bosom to displace the sentiment of love. They are its rivals, not rarely its masters; but woman knows not such distractions; one passion only sits enthroned in her bosom; one only ideal is enshrined in her heart; it knows no rival, no successor.

We speak the language of cold and exact science, and not merely of rhetoric and fancy; they are facts, gathered from history, anthropology, psychology.

The all-absorbing wondrous love of woman is something man cannot understand; to him it is an unexplored deep; he sees of it nothing but the rippling water, the foam crest at play on its surface. But philosophy looks beneath, sinks its plummet and line into the abyss of wa-

"The Mother in Her Office Holds the Key to the Soul." [415]

ters, and beholds in woman the creative, stronger sex, with a concentration, stability, and power of will to which man is a stranger.

"God is love;" this is the conclusion of philosophy, and the sublime utterance of inspired poetry; and he has made woman to possess, in a greater and purer degree than any other created beings, this element of his own nature.

God is the creator of the universe; and he has made woman to be another creator; to her is given the perpetuity, the early training, and the destiny of the race.

At a mother's feet, the bent is taken for weal or woe which all future life cannot alter. And is it too much to say that the kindly sympathies and swelling affections of manhood can be traced to infancy, while clinging on a mother's neck, listening to her songs, her words of counsel and confidence; when the confiding heart of childhood appeals to her in trouble or distress? Is she not its book of life, its book of love, its book of wisdom, its book of destiny?

Philosophers have analyzed, divines lectured, and poets sung of the melody and music of a mother's love; but have any of them caught from its deep foundations its nameless, numberless, impassioned sympathies?

It follows through all our lives, echoing its counsels and precepts, and by the touching melody of its pathos, interwoven in our natures and clinging to the heart, compels in the musings of darker hours the eye to flow in secret.

"I am going," said Washington to his mother, "to fulfill the high destiny lately conferred upon me; as soon as the public business shall have been attended to,

I shall return." But here he was interrupted with the words of his mother, "You will see me no more, my dear son; the disease which is approaching my vitals warns me that I shall not be long of this world; but go, George, fulfill the high destiny Heaven appears to consign you; go, my boy, and may the blessings of that Heaven and your mother be with you always." That Fabian brow relaxed from its lofty bearing, that form which might have awed a Roman senator, bent beneath the swelling flood of unutterable emotions; there was long suspended silence; the orator was the heaving bosom and buried head.

"A good boy makes a good man," was one of the sayings of George Washington's mother, and in this we have the secret of his greatness.

During Lincoln's second term of office, accompanied by a friend, he visited his mother's grave; a great man never drew his infant life from a purer or more womanly bosom. Here at her grave, where her sensitive heart and weary hands had crumbled into dust, and had climbed to life again in forest flowers, the great man wept like a child: to his friend he exclaimed: "All that I am and all that I hope to be, I owe to my angel mother; blessings on her memory!"

Yes, I repeat it; blessings on the memories of the mothers of Washington and Lincoln.

Yes, blessings on the memory of all the mothers who have reared into noble manhood and womanhood their children.

Some of them have spun the yarn and carded the wool, tilled the garden and kept the fire, nursed through nights of sickness, and kept their babies neat and clean;

sung to them strains which came afresh in manhood; found time in care and constant toil, in nights devoid of sleep, to impart rich lessons of virtue; yes, blessings on them, one and all.

"Oh, why should the spirit of mortals be proud,
Like a swift fleeting meteor, a fast flying cloud,
A flash of the lightning, a break of the wave,
Man passes from life to his rest in the grave.

"And we are the same our fathers have been;
We see the same sights our fathers have seen;
We drink the same stream, and view the same sun,
And run the same course our fathers have run.

"Yes, hope and despondency, pleasure and pain,
Are still mingled together in sunshine and rain;
And the smiles and the tears, the song and the dirge,
Still follow each other, surge upon surge.

"'T is the wink of an eye, 't is the draft of a breath,
From the blossom of health to the paleness of death;
From the gilded saloon to the bier and the shroud.
Oh, why should the spirit of mortals be proud!"

CHAPTER XXXVI.

CIRCUMSTANCES WHICH DEVELOP THE GREAT AND GOOD IN HUMAN CHARACTER.

"I know, indeed, the mind that feels the fire
The muse imparts, and can command the lyre,
Acts with a force and kindles with a zeal,
Whate'er the theme that others never feel;
If human woes her soft attention claim,
A tender sympathy pervades the frame:
She pours a sensibility divine,
Along the nerve of every feeling line,
But if a deed, not tamely to be borne,
Fire indignation and a sense of scorn,
The strings are swept with a power so loud,
The storm of music shakes the astonished crowd."

Discussing as we are the physical, mental, and moral creation, this work would be incomplete without some reference to the circumstances which develop the great and good in human life and character.

Even as the world itself has been evolved from war and turmoil, by a long series of seemingly adverse circumstances, melted down and agitated with fire, deluged with floods, buried in ice, tossed from its base, rolled on its axis, its shell broken in pieces like a wafer, only to rise out of destruction to a higher plane, to evolve from turmoil a grander serenity; so human sympathy, charity, nobility, and intellectuality are evolved amid the strife and conflict of human avarice and human passion. ex

"Confronted Death Itself in the Heroism of Conscious Duty."

posed to the din and play of evil, and the lightning of human craft, purged as it were with fire;

> Bent but not broken;
> Withered but not dead,

it arises from these ordeals to strength and power.

Disadvantages are often advantages; seeming ills, blessings in disguise; there are birds in the clouds, and there are angels above human distresses.

A large portion of the world's best and strongest men have been nursed and nurtured in poverty; the hand of assistance has been their own; their help has been the midnight lamp; such was the history of Shakespeare, Blackstone, Galileo, Kepler, Columbus, Harvey, Newton, Milton, Voltaire, Hugo, Dickens, Lincoln, Grant; their lives are all painful to read; there are pages in their histories which have not been written.

Such men have battled against conspiracies organized in pomp; run the gauntlet of villainous battle-axes lifted to kill; confronted death itself in the heroism of conscious duty.

Shame on you, politicians, those among you pursuing avocations with the venomous tongue of lies, and the black-mouthed vomit of calumny.

Shame on you, newspapers, those among you to be bought and sold at a price, to herald the contagion of falsehood.

Shame on you, colleges, those among you making no standard of merit or recognition of self-acquired knowledge, but selling titles for gain, and fledging "dummies" who have filled the vacuum of an empty chair with badges of wisdom.

Shame on you, churches, those among you lending your sacred influence against those who do not affiliate with you, in favor of such as are dishonest enough to be hypocrites.

Shame on you, social rings of red tape, those among you crushing beneath your feet whomsoever falls in the way where you would cover vice, to shield and magnify a brother.

The whole history of genius has been out of the veil of your influence; it has been conceived and nourished under the stripes of your power; it has grown to manhood amid the elements of your opposition; its muscle and sinew have been evolved by encounters with you; and the first conclusive proof of its power was when in battle it throttled and conquered you; when for the first time, like a whipped dog, you began to pay tribute to a master. And that master dying, you cover his grave and his memory with flowers, and crown him with the signets of a god.

And yet you fill a place in the order of things. You are the fires of the early ages, that made possible our beautiful world. You are the floods that developed a higher humanity. You are the glaciers that made Edenic gardens filled with human purity and human happiness.

The heart of humanity is either crushed or rises in proportion to the mountains in its path. You, the struggling weak, count it gain when devils surround; God is with you; when the sky is dark, a heaven of tenderest love is shining above you; when no hand is near, God's own hand is leading you.

In the words of Victor Hugo, the lives of nature's noblemen have been lives of "mire, but soul," of battles,

defeats, and victories. Hell is not easily conquered, but we have the assurance before us that the more desperate the contest the more glorious the victory.

God often casts men of stern stuff into the abyss; and for what end? — To search its depths; and from poverty, contempt, pestilence, and suffering, search out the good, the just, the noble, and bring back the pearl of truth.

Wealth reclining in luxury, opulence, and ease, knows little of this fatal world; placed on high it is out of it, out of its pity, out of its sympathy, out of its charity; it is heartless and without a soul.

It beholds not the deserted child, the orphan, left alone in this immeasurable creation, with the load of an unfeeling darkness called society resting upon it, and crowding it into the slums, where cold and hungry it is left to die.

It cannot see the form of goodness, truth, and justice in the rags of a vagabond; or the angel of love, devotion, sympathy, and purity in the woman's form whom the sirens of fashion have vilified and cast overboard into the dark sea.

O opulence! let me tell you what to do. As you are powerful, be brotherly; as you are great, be tender. Look on the picture of humanity, and "do unto others as you would that they should do unto you."

"The quality of mercy is not strained:
It droppeth as the gentle rain from heaven
Upon the place beneath: it is twice blest;
It blesseth him that gives and him that takes:
'T is mightiest in the mightiest: it becomes
The thronèd monarch better than his crown;
His scepter shows the force of temporal power,
The attribute to awe and majesty,

Wherein doth sit the dread and fear of kings ;
But mercy is above this sceptered sway :
It is enthronèd in the hearts of kings,
It is an attribute to God himself ;
And earthly power doth then show likest God's
When mercy seasons justice."

Ye great, it is in your power to change the picture of human misery ; little girls "on the town" at twelve, dying at twenty ; the pale faces of widows, with families of children, in garrets, sewing eighteen hours a day for a meager pittance ; one half of all the families of Christian nations crowded into a single room ; with all the modern inventions, arts, and mechanics, the great mass of mankind bent and deformed from the drudgery of sixteen hours a day ; and children of eight, who should be in school, or basking in God's sunlight, toiling in factories and mines. And when the mill stops, the mine shuts down, the factory ceases to run, they starve !

Take heed, O wealth, of the human sea beneath your feet ; of the suffering which your avarice compels, of the misery and crime which your sordid love of gold augments ! Society, look beneath your feet, cast your eyes down ; and ye rich, pity the poor ; ye great, pity the small ; yes, pity yourselves ! for humanity is in its agony, and when the lower part of the trunk dies, your splendors topple and fall, the abyss yawns for all.

Let nations and cities of great name,
And regions long since desolate proclaim ;
Nineveh, Babylon, and ancient Rome,
They speak to the present, and times to come :
"Oh, learn from our example and our fate,
Learn wisdom and repentance, ere too late."

E'en as the ice breaks and disappears when the sun comes forth in his spring-couch of gold, reflecting genial

rays; so the icy fiber of governments, with their social systems of men, resting on a liquid sea of human passions, breaking into fragments, melt and surge for a time, purifying themselves. And to accomplish all this, what is necessary? — One of thy looks, O sun! one of thy rays, O liberty!

How greatly to be lamented it is that the great mass of mankind, disregarding the warning voice of past generations coming up from ten thousand graves, still shut their eyes and even sacrifice principle, to keep popular with the passing crowd upon whom they depend for a momentary fame; but they are not the men whose names are written in letters of gold on the immortal page of history; they are destined to perish from all remembrance, and no trace of them left on earth.

Be just, and fear not, prompt in the path of every duty, forgiving, charitable, kind; these are the essentials of true greatness.

The philosopher, though chained to earth, may raise himself above the world, and lift his towering head to the stars, and struggle to grasp the mighty plan of Jehovah's universe, with all its moving worlds; yet if this be all, true greatness does not lie here.

True greatness does not belong to the hero; the laurels he wears were gathered at the cannon's mouth, from a soil enriched with human gore, and watered by the tears of bereavement. His way to it lay over thousands of his fellow-creatures whose warm hearts had ceased to beat; and the music which followed his march was the orphan's wail and widow's moan; true greatness does not lie here.

The man of wealth may rear to himself lofty mansions, and construct edifices of gold; he may attain possession

of spacious lands, and the secret crevices of the mountains may open to him their store-houses of gold and metal; and railroads, mills, and ships augment his glory, and carry the shambles of his traffic into the utmost parts of the globe, causing millions to hurrah at his name and kneel at his approach; true greatness does not lie here.

True greatness consists in something more than riches, worldly power, or intellectual attainments; true greatness consists in the lofty aspirations after intellectual and moral truths; and when these are found and cherished, so deep will be the conviction of duty, combined with sterling honor, that no fear of frowns, no bribes of wealth or splendor, or even hazard of life, or exposure to wasting torture, can deter that man from the straight path of that duty, or the bold acceptation and promulgation of such truth.

Should any challenge me to point out the example of such a man on the page of history, I would point to the one perfect example on the sacred page: I would point to the Son of Man, in the sublimity of whose life, in the wisdom of whose counsels and precepts, and in the heroism of whose philanthropy, language is impoverished, all descriptions fail, and eloquence is darkened forever.

"It is life's mystery; the soul of man
Createth its own destiny of power;
And, as the trial is intenser here,
His being hath a nobler strength in heaven.
What is its earthly victory? Press on!
For it hath tempted angels. Yet press on!
For it shall make you mighty among men;
And from the eyrie of your eagle thought,
Ye shall look down on monarchs. O press on!
For the high ones and powerful shall come
To do you reverence: and the beautiful

Will know the purer language of your brow,
And read it like a talisman of love!
Press on! for it is godlike to unloose
The spirit, and forget yourself in thought;
Bending a pinion for the deeper sky,
And, in the very fetters of your flesh,
Mating with the pure essences of heaven!
And I would press the lesson, that, when life
Hath half become a weariness, and hope
Thirsts for serener waters, go abroad
Upon the paths of nature, and when all
Its voices whisper, and its silent things
Are breathing the deep beauty of the world,
Kneel at its simple altar, and the God
Who hath the living waters shall be there!"

CHAPTER XXXVII.

FUTURE OF HUMANITY ON THE EARTH — PROPHECY OF A MILLION YEARS — PRESENT CONDITION OF THE INHABITANTS ON THE PLANET VENUS.

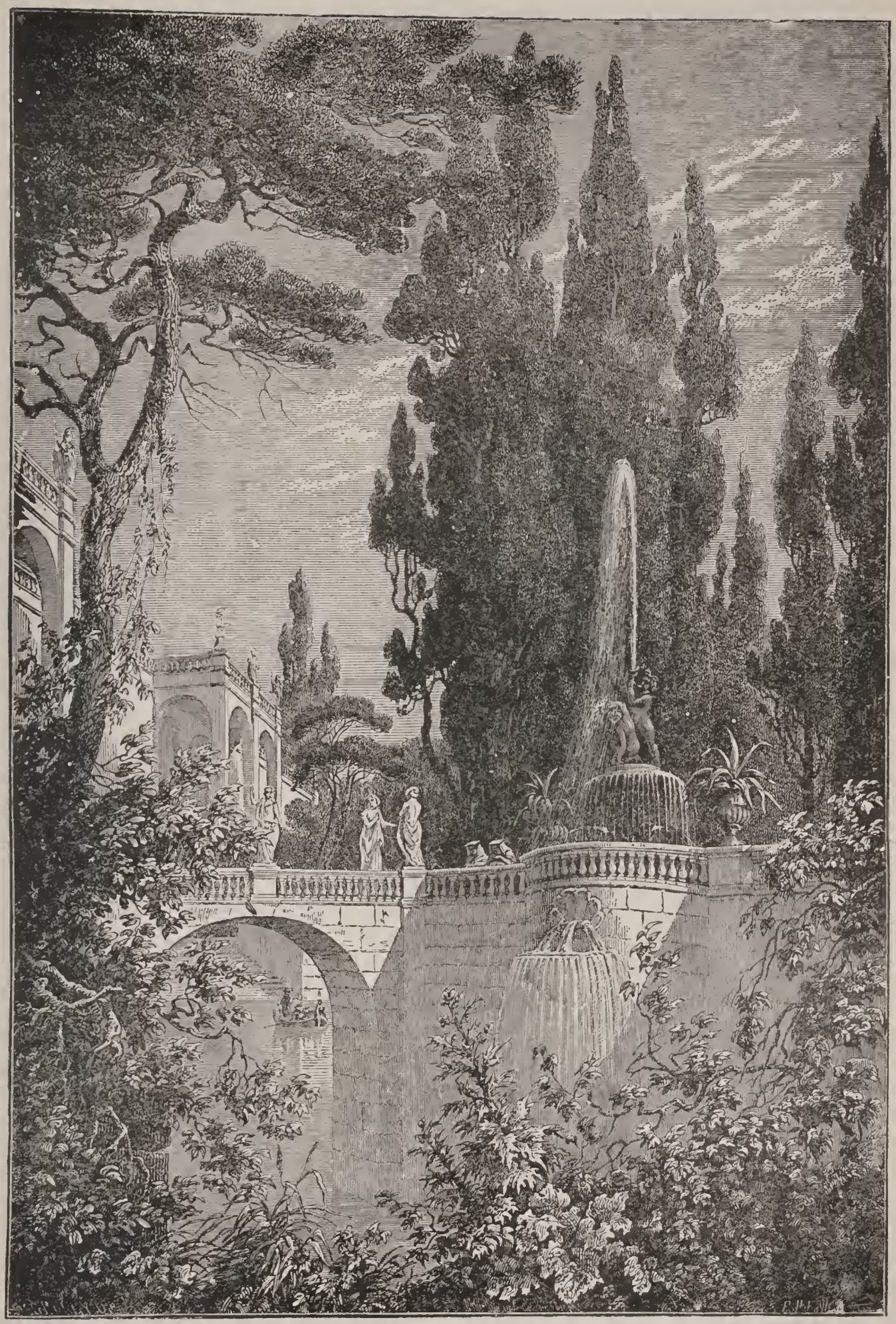
"The light of the moon shall be as the light of the
Sun; and the light of the sun shall be sevenfold,
In the day that the Lord bindeth up the breach of
His people, and healeth the stroke of their wound."

In forecasting the future of humanity on the earth, let us attempt an ideal description of the people and condition of society existing at the present time on the planet Venus; and afterwards endeavor to analyze the forces and evolutions in the long ages of her mighty history, that have resulted in her present high intellectual and moral attainments.

"I had a dream which was not all a dream."

I saw mighty cities, with ribs of solid steel, temple-decked and sumptuous with splendor, with walls of granite and roofs of marble vaulting up, abounding with sculpture, wrought from the most varied and beautiful stones.

Ages of labor and human genius had accumulated vast forests of imperishable art. Beneath my feet were polished stones. Man had e'en excelled nature in the formation of columns of colored glass, china, porcelain, and other indestructible, emerald imitating, and diamond



Ideal Scene On The Planet Venus. The Earth Will Occupy The Place of and be Like Venus.

reflecting transparencies of varied colors, composing the material of column and cornice.

Panoramas and decorations of infinitely varied and gorgeous paintings, confused the artificial with the real, and pictured the history and philosophy of ages with the charms of love, and childhood's laughter.

"Palms in clusters, knots of paradise," blossoming flowers, fragrant plants, and evergreen shrubbery, wrapped art and grandeur in "isles of summer Eden."

Music, responsive to echoing walls, in halls for its purpose built, mingled with human voices of all ages. I listened motionless, unconscious, wrapped, inspired. All the spheres joined in the chorus, with mingled intonations of heaven and hell; with interludes of singing birds, whispering zephyrs; and requiems of every human passion rang out, as from the depths of my soul, combined with the symphonies of poetry, teaching pathos, sublimity, science, and philosophy.

Intoxicated with the sumptuous and never-ending splendors of the cities, and reeling with the impulse of a thousand joys, I found myself conveyed to the country, on lightning speed, as if palaces were transported by some mystic hand of magic, in the brain of human gods controlling the elements.

Here, in the serene quiet of shady nooks, where winding, dreamy rivers flashed their silver amid hills and landscapes of verdure, or mountains of mighty grandeur, holding their heads, mantled with clouds, high in the eternal sunshine; I beheld a country tilled and cultivated in all its mighty lengths and breadths, and blossoming with ripening fruit, and the rich luxuriance of one continuous garden.

Each individual country home was a paradise of art and flowers, where wife and children, father and home, with social love, seemed to envelop the spot, with light all around it.

Mechanical inventions had been carried to a state of absolute perfection, and people conversed with each other in all parts of Venus, without the aid of telegraph or telephone, which instruments had long since been abandoned.

Distance was overcome, and lightning means of locomotion linked city to city, and brought the country to its door, where all joined in social, loving commune.

All the elements, fire, water, and electricity, were harnessed, and directed in obedience to the great brain of man, in multitudinous forms of labor, terracing and tunneling the mountains, walling and bridging the rivers, and fixing rock barriers to ocean's wave, quarrying the hills for metal and stone, macadamizing streets, rearing cities, cultivating the soil, or attending flocks.

Human labor was reduced to the minimum of pleasure, and all alike sought the opportunity of work, and wrought for the happiness it gave. Every form of labor was performed willingly, lovingly, passionately; as the prima-donna sings, the artist paints, or the mother nurses her child.

I saw that men were free, reveling in the sunlight of absolute liberty. And a spirit of emulative pride in philanthropy prompted all; for humanity was no longer selfish.

All men absolutely forget their identities and personalities in the love of their fellow-men, and the life and object of all was to make others happy.

The money-changers no longer existed, with their sordid barter and sale and cold avaricious cunning, as on the earth, robbing the poor and hoarding treasures of wealth, while misery starves.

I read a motto, and inquiring, was told that it had been proclaimed in Venus before earth's humanity was born. I saw it sculptured in rock, and read it in letters of gold, on monuments and temples, and saw its essence beaming from every heart : —

"It is more blessed to give than to receive."

Sunlight was free, water was free, and the soil was free ; e'en temples and palaces were the common property of all ; and like separate rays of light, art, invention, music, and song, the revenue of labor, and the productions of the brain of genius, like the sunlight, were the inheritance and birthright of all the people.

Selfishness was unknown, and all alike toiled for the general weal and general welfare.

In the place of the earth's hierarchy of kings, lords, and a wealthy privileged class, with inherited titles or acquired caste, extending down to a people of serfs, resting on a stratum of poverty, misery, and crime ; I beheld a social hierarchy of men and women, in clustered societies, reaching from state to kingdoms, and high, exalted personages ; for men and women were still emulated and loved for their leadership, their genius and their godlike qualities, their talents, their inventions, and the boons they had conferred on humanity.

Each individual human being shone forth like a separate star or sun, in a mighty galaxy of varied colors and

grandeur; and the excelling virtues received the homage they deserved.

Men and women fell with an enthusiastic impulse, under the leadership of great chieftains; who not from personal ambition, or self-sordid glory—

"By that sin fell the angels"—

but raised to power by the universal acclamation of an admiring people: who, recognizing the mind and heart of a higher order of genius, selected them as their leaders.

All took their respective places, proudly and lovingly, under the leadership of their chieftains, which extending from high to low, great to small, constituted a republic similar to our own. And all of its teachers and leaders were created by the people, out of the people, for the people, save that there were no formal elections; for humanity recognized with one accord the ebb and flow of talent, the rise and fall of genius, the depth and degree of every virtue. And lesser, clustering around greater lights, formed orders of varied degrees and reflections of coloring, showing itself here in music, there in mechanics, here in painting or sculpture, there in agriculture, here in mining, there as teachers of children.

And around leaders, from the centers of clubs; or clubs, clustering around higher centers of brighter lights, all men gathered in the occupation and vocation of their choice. Thus, great projects were planned and accomplished by volunteers, who with enthusiasm took their places, and acted their parts in its accomplishment.

To illustrate the willing leadership among men: In a mighty temple of art, I beheld a painting that had been wrought by a student without position, but which other artists came to admire, and which they recognized as the

THE VENIC AGE AND MILLENNIUM: "EVERY MAN UNDER HIS OWN VINE AND FIG-TREE."

grandest and most sublime production that the ages had wrought. The great painters, therefore, made him their chieftain; and in a mighty panorama, the outline of which he had drawn, took their places as masters, according to their excellence, in superintending the work of its individual parts; while painters of lesser capacity, or excelling in the completion of wonderful detail, found each his natural place. And this was true in every department of labor, all men and women occupying the place and filling the sphere of their choice.

All things were the common property of all, and absolutely free; with labor-saving machinery in every department perfected, labor was reduced to the minimum; and the soil yielding its produce in abundance, satisfied the needs of all.

The agriculturist poured the rich and sumptuous harvest into the lap of all, and the mill its manufactured produce.

Idleness was unknown; for while there was no forced labor, all sought the occupation of their choice and pleasure; in this spirit all work was done, all labor performed. The artist gave his paintings, richly rewarded if his genius gave pleasure and admiring acceptance. So the primadonna sang, the mechanic wrought; and all sought to excel, to please; satisfied if their work gave happiness or pleasure to others.

Like Christ and his disciples, the people of Venus —

> "Had all things in common, and
> Loved their neighbors as themselves."[1]

[1] Such a system of government, or lack of government, which we have assumed to exist on the planet Venus, would be absolutely impossible at present on the earth.

The present governments of the civilized world contain within them

In short, the happiness of all depended on producing in others some new pleasure; and the product of labor and of genius sought places of acceptance by a system similar to Sisters of Charity, making distributions among the people.

Man and wife were twain, one flesh; one in love, one in mind, one in admiration, sympathy, affection, and one in the happy families which clustered around them, and cemented every home into one radiating light of many colors.

And girls found their lovers, not like the frightened plucking of a distracted bird, but like flowers bending to the sun; love attracted to itself sympathetic love, and nature mingled with nature in an adhesion godlike and eternal.

With the absolute freedom and glorious liberty of every man, woman, and child under heaven's wide arch of liberty, all took their places and acted their part in the universal good. The desire alone to please and render

elements of progress, and are as high as the general intelligence of the people composing them will admit.

Our own republic, founded by our fathers, who brought to these shores the divine right of manhood to every individual, is a monument of wisdom, and equal to the broad demands of American enlightenment.

As long as human passion, vice, and crime continue, with man's inhumanity to man, a government of rigid law, protecting the weak, shielding the innocent, providing for the poor, and educating the children, is the shield of God to man.

Whomsoever would attempt to overthrow by force of arms our divinely-established institutions of law and order, let them suffer the full penalty of such treason.

Whomsoever desires to make law unnecessary, let him lead a life of Christian purity, love, and charity, and spend his thought and labor in doing good. And when mankind shall have become imbued with this feeling, governments no longer necessary will cease to exist; until then, let every man —

"Render unto Cæsar the things which are Cæsar's,
And unto God the things that are God's."

others happy prompted the orator, the writer, the inventor, the scientist, the mechanic, the tailor, the cook, the agriculturist, and the teacher. All found their proper spheres, and labored for the pleasure it gave to themselves in others.

Art and invention, science and sculpture, poetry and music, painting and architecture, medicine and agriculture, rose to a state of absolute perfection.

Want and poverty had no place in this system. Sickness was reduced to a minimum; and mild the pain relieved by science and soothed by angels of sympathy.

And crime,— could it grow in such a soil, or prosper in this universal air of kindness and love — a kindness that in the earlier ages of Venus had set up the motto,—

"Give to him that asketh thee;"

that had covered its temples and monuments with benedictions and blessings on "peace-makers," the "meek," the "merciful," the "righteous," the "pure in spirit;" that had written in letters of gold on sculptured stone obelisks and altars —

"Resist not evil, but whosoever shall
Smite thee on thy right cheek, turn to
Him the other also. And if any man
Will sue thee at the law and take away
Thy coat, let him have thy cloak also.
Agree with thine adversary quickly.
Return good for evil. Love your enemies.
Bless them that curse you. Do good
To them that hate you; and pray for
Them that despitefully use you"?

Here, in this social system of Venus, the small were great and the great small; the king was subject, and the subject king. O bliss unspeakable! happiness effulgent!

my voice rang responsive to the song, Long live the pure, the great, the good!

A flash of lightning, a shriek of pain, misery's outcry in my ears, guttural tone of demons, the heavy tramp of horses, a tumultuous mob, bayonets of armed soldiers forcing back a maddened throng, a hoarse command of "fire," rattle of musketry, the cannon's loud roar, an impermeable charge, yells of the infuriated, groans of the dying, the heavens on fire with flame and passion, a hissing hell of imprecations! — staring, I awoke; it was all a dream — but hell was here!

Making a rapid survey of the scene as an inhabitant of Venus would describe the earth, I beheld Egypt, Phenicia, and Greece in surging tides of conquest, peace, and war. I beheld Rome, overrun with hordes from the north, and struggling against cannibal Huns from the south; and Cæsar retaking the empire, and pushing his victorious columns into Britain. I beheld Paris drunk with the world's first draught of liberty, and mad with slaughter, while Robespierre and Louis XVI. are offered in the wholesale sacrifice; Moscow on fire, and Napoleon menacing the powers of the world, his legions scattered in Waterloo like dry leaves. I beheld Cortez laying waste the peaceful civilizations of Mexico; allied France, England, and Turkey bombarding Sebastopol; Wolfe climbing the impregnable steeps of Quebec; Charleston wrapped in flames; the snows of Valley Forge red with liberty's footsteps, marked in blood; slavery and its master struggling in the wilderness, at Vicksburg and Fort Donaldson, and leaving the earth strewn with the corpses of a million dead.

I beheld earth's humanity, like the tides of the mighty sea, tranquil and calm at points between the ebb

THE EARTH AS VIEWED BY AN INHABITANT OF THE PLANET VENUS.

and flow, with sunshine and peace in rainbow civilizations, and light in clouds foreboding tempests; then the impetuous charge, defeat or victory: — a struggle for power, for gain, for freedom, for justice; a seething, surging mass of power and oppression, slave and master, caste and serf, religion and superstition, capital and labor, opulence and starvation, knowledge and ignorance, truth and error, purity and crime, light and darkness,— all, in one seething pot of fermentation, and working out a slow yet inevitable destiny.

Civilizations may ebb and flow; France and England go back to barbarism, proud Columbia fall into ruin, and liberty die while the clamorous multitude shout her name; but civilizations new and brighter, with new, better, and broader forms of self-government, will arise on their ruins, and out of the ashes of the old.

"Where now is Britain? — where her laureled names,
Her palaces and halls? — Dashed in the dust.
Some second Vandal hath reduced her pride,
And with one big recoil hath thrown her back
To primitive barbarity. Again,
Through her depopulated vales, the scream
Of bloody superstition hollow rings,
And the scared native to the tempest howls
The yell of deprecation. O'er her marts,
Her crowded ports, broods silence; and the cry
Of the low curlew, and the pensive dash
Of distant billows, break alone the void.
Even as the savage sits upon the stone
That marks where stood her capitols, and hears
The bittern booming in the weeds, he shrinks
From the dismaying solitude. Her bards
Sing in a language that hath perished;
And their wild harps, suspended o'er their graves,
Sigh to the desert winds a dying strain.
Meanwhile the arts, in second infancy,
Rise in some distant clime."

I will leave unwritten the details of the picture, prophesy not the sunshine or the shadow, the desolations, revolutions, wars; new civilizations and glorious nations yet to come, ebbing and flowing like tides of the sea; emigrations and migrations forsaking and depopulating the old, planting and creating the new; French revolutions,— black nights of debauchery and massacre; — with new experiments of self-government, and slaves planting the germs of freedom and turning the desert and the wilderness into sculptured gardens of art and science; with glories approaching nearer and nearer the ideal of the dream of the planet Venus.

We live in a transitional age, an age of shadow, compared to what shall be on the earth. The human race has but dimly begun. We are but the initial types of glorious races yet to come.

In the struggle of coming ages, ignorance in every form shall have disappeared, and its place usurped by the mighty of brain and of heart, who shall terrace the mountains, wall the rivers, and convert the deserts into fertile, blooming plains.

"The earth shall blossom like a rose,"

and vegetate with a fertility and beauty now unknown; the seasons will soften, and both their mildness and grandeur increase.

The air and the deep seas will be traversed, and the entire history of the past and the future scientifically known.

New and more rapid methods of locomotion and communication will be discovered, and the inhabitants of Venus will find means of converse with the inhabitants

of earth. Human life will have become greatly elongated, and its pleasures more composite.

Notwithstanding the general outline of progress in the future of humanity, there are dark shadows in the horoscope.

For our world, already old in events, shall witness mighty things to come. Let him read Isaiah and the prophets, who would understand the science of coming events.

The earth, completing her present tremendous cycle, unbalanced in the heaven, shall tremble on new centers of motion, overturning on itself from pole to pole, commencing a new and nearer path around the sun.

> "The earth shall reel to and fro like a drunkard.
> He will shake the heavens, and the earth shall
> Remove out of her place. And there shall be
> Signs in the sun, and in the moon, and in the stars,
> And upon the earth distress of nations, with
> Perplexity, the sea and the waves roaring;
> Men's hearts failing them for fear, and for
> Looking after those things which are coming
> On the earth; for the powers of heaven shall
> Be shaken. As a vesture shalt thou change them.
> For behold I create a new heavens,
> And the new earth shall remain before me."

We have shown in former chapters that the position of the earth in reference to the North Star is perceptibly changing, and that in the remote future, the earth will have reached a position in the heavens so far at variance to the forces which gave her axial and orbital motion, that the earth's momentum will be overcome, a new axis established, with a new orbit, nearer the sun.

At this mighty period, not alone the earth, but all

the planets, alike, unbalanced in their attractions, will be involved in the vortex of a similar crisis.

> "Yea, once more I shake not the earth only, but
> Also heaven. And the stars of heaven shall fall."

All the planets will establish new poles, a new equator, and commence new and nearer paths around the sun.

In the night of this terrible crisis, the planet Mercury will fall into the sun's resurrecting fires, Venus will take the place of Mercury, the earth will take the place of Venus, Mars will assume the place of the earth, and the asteroids the place of Mars, Jupiter the place of the asteroids, Saturn the place of Jupiter, Uranus the place of Saturn, and Neptune the place of Uranus.

We have shown in former chapters that such are natural consequences in the history of planets; that all planets occupy positions near the sun proportionate to their density: leaden planets near the sun, and nebulous planets remote from the sun. We have shown that planets are steadily evolving from gaseous to solid bodies, and that with such changes, they must take positions nearer and nearer the sun, until at last they fall into his fires.

In the night of the mighty convulsion, as explained in chapter nine,

> "When he causeth a mighty wind to blow,
> When he sendeth out his waters and they
> Overturneth the earth, when he shaketh
> The earth out of her place like a drunkard," —

in the night of that mighty turmoil, amid the struggle of forces and of planets to find an equilibrium, the moon will

be drawn closer to the earth, as together it and the world assume a position nearer the sun.

"The light of the moon shall be as the light
Of the sun ; and the light of the sun
Shall be sevenfold in the day the Lord
Bindeth up the breach of his people."

In the night of that mighty convulsion, the crust of this world will have been broken like a crumbling shell ; water in the arms of fire, issuing from innumerable vents and openings, will darken the air with cinders and ashes ; the world wrapped in clouds and the atmosphere dense with smoke and vapor, will turn —

"The sun into darkness, the moon into blood."

Chaos and anarchy shall have had its day among the stars ; old ocean will sing requiems to entombed cities, dead nations, and dead races ; frigid cold will gather about the antipodes of two new poles, while a tropical sun will unloose the bands of arctic ice ; the devastations and changes will be the throes and convulsions of a mighty birth. After the night will come a new day ; order will reign again serene among the stars ; a more beautiful sun will smile upon the earth, and send healing in its beams.

"When these things begin to come to pass, then look up,
And lift up your heads, for your redemption draweth nigh."

The few surviving inhabitants, "the elect" of the earth who shall have escaped the earthquake and flood, will find themselves transported to a new clime and soil, by the new rotary motion of the earth, changing the positions of former arctic and equatorial regions, as also land and sea.

The new conditions and environments surrounding the human seed, as it multiplies age by age, will be like all transplantings to a more favorable soil; the human brain will enlarge, the human heart will develop and unfold, humanity will assume a condition so far above the present as to exclude the possibility of our forming an adequate conception.

"And righteousness will cover the earth
As the waters cover the sea."

The geology of this earth is the history of all the evolutions, all the changes, and all the past of the earth; and the history of our planet is the history of all planets; first a nebula, then a comet; then a cometary, fiery chaos, vapor; then an age of cooling moisture and falling granite crystals, forming rock; next an age of falling waters, and oceans filled with life; from the fishes came the age of reptiles, and from the reptiles came an age of mammals, and from the mammals came the age of man: all planets have a history of development, and a history of the development of life upon them. In all the past, through all the geologic ages, amid all the convulsions of nature and the stupendous changes the earth has seen, there has been progress.

Such is the record of all the past, and such will be the watchword of all the future "progress."

The planet Venus has seen all the changes of our world and one more; she is in her eighth day, or era, occupying a position nearer the sun; consequently the inhabitants of Venus are higher, grander, nobler, better, purer than we. The planet Venus is now in the full tide and glory of the Christian millennium.

The history of the evolutions of the planet Venus,

and the progressive changes of her inhabitants, rising step by step to the pinnacle of her present glory, is the history of all planets.

The earth, now in her seventh day and age, approaching the eighth, will soon take the place and be like Venus.

Therefore, the present grandeur and glory of the inhabitants on the planet Venus, is the future of the earth. In the earth's eighth era, when she shall have assumed the present circle of the planet Venus, arriving at the millennium variously prophesied in the Bible,—

> "The old serpent, which is the devil and Satan,
> Shall have been bound for a thousand years.
> He shall deceive the nations no more till the
> Thousand years be fulfilled. And they lived
> And reigned with Christ a thousand years."

The period of a thousand years must not be construed literally in the exact number, but like numerous similar symbols in the Bible, it expresses an indefinite period of time, covering the whole Venic age,—or day,—when the earth shall occupy the place of Venus, moving in the present circle of Venus around the sun, a period of time which, in the ninth chapter of this work, from astronomic and geologic reckonings, was shown to embrace the long period of perhaps six hundred thousand years.

This mighty period of human happiness will roll into eternity, when other stupendous convulsions shall befall the earth, reaching the climax in her orbit around the sun, of an impossible ellipse; the earth shall again be shaken from her foundations, overturned on her axis from pole to pole; the crust of the earth will be again broken and distorted, as she assumes the position and circle of the planet Mercury, moving in close proximity to the sun.

At this second crisis of the future, the planet Venus will be precipitated into the sun, and all the outer planets will take steps of involution, to occupy positions nearer the sun.

The crust of the earth shall be broken like a crumbling shell; the Venic civilizations will go out in a night; the grand cities, in all their beautiful sculpture and accumulated art, will be enveloped with earthquake débris, and the smoke and ashes of a thousand volcanoes; human beauty and health will diminish and disappear; art and science become forgotten, and language lose its meaning, while humanity totters blindly to the abyss which swallows all. The Revelator, referring to this downfall of humanity after the millennium or Venic age, uses the following language:

"Power shall be given unto the sun to scorch men with fire.
Scorched with great heat, men shall blaspheme God.
Satan shall be loosed out of his prison, and shall
Go out to deceive the nations, and gather them to battle."

At this period, after the millennium, or Venic age, the earth will occupy the present circle and position of Mercury, in which condition human life, still existing, will labor under a thousand dwarfing influences, not only from the heat occasioned by the earth's proximity to the sun, weakening muscular activity and brain tissue, but the moon, now falling age by age towards the earth, shall at this period be precipitated upon it, which event is thus described in Revelation:

"And I saw a star fall from heaven upon the earth,
As it were a great mountain burning with fire.
Fire mingled with blood was cast upon the earth,
And the name of the star was called wormwood."

IDEAL SCENE ON THE PLANET MERCURY. "THE EARTH WILL OCCUPY THE PLACE OF AND BE LIKE MERCURY." [453]

The moon, with a terrible momentum, will break through the earth's crust into the bottomless pit of central fire. A third part of the earth's inhabitants will be destroyed, and the balance will struggle against poisonous and enervating influences, which, although detrimental to man, will be productive of a bountiful vegetation. Spontaneous tropical fruit will supply man, without an effort, with the necessary food for subsistence, as enervated and enfeebled man lives again in the atmosphere of base passion, a stunned savage, reflecting but a feeble image of the high, exalted condition he once enjoyed.

The long period of human blindness and darkness shall have finished its course, and a final convulsion, caused by the changing positions of the planets, shall precipitate the earth into the seething fires of the sun. This final catastrophe, when the earth shall fall into the sun, is described by the Revelator in the following language :

"An angel took up a stone, and cast it into the sea,
Saying, Thus with violence shall Babylon[1] be thrown down.
And a third part of the sun was smitten. A woman
Clothed in the sun, and the moon under her feet.
The devil was cast into the lake of fire and brimstone,
And death and hell were cast into the lake of fire.
And death and the grave delivered up the dead which
Were in them ; and the sea gave up the dead which were in it,
And I saw the dead, small and great, stand before God,
Multitudes, multitudes in the valley of decision."

The earth finally precipitated into the resurrecting fires of the sun, and dissolved with fervent heat, other planets will assume her former position in the heavens,

[1] See picture of seven days, or seven mountains, on which the world has sat — double meaning.

taking positions step by step nearer the sun, at last following the earth into his fires. Each and all of the outer planets shall one by one, after the earth, fall into the sun; until they have all been gathered into his bosom. The Revelator speaks of these outer planets as "fowls," in the following language:

> "I saw an angel standing in the sun, and he cried
> With a loud voice, saying to all the fowl that fly
> In the midst of heaven, Come and gather yourselves
> Together unto the supper of the great God."

Following the earth, each and all the planets shall share her fate and glory, plunging at last into the sun's resurrecting fires. But more of immortality in the following chapters.

Turning from the consideration of the things which will come to pass in the tremendous future, to the present on the earth with its prospects, infinite periods lie before us in the march of progress.[1]

Humanity is in the early dawn of its destiny, the cradle of its manhood; all the present is progress, all the future, hope.

Man, thy capacities are angelic, thy nature is divine! the star of thy redemption is in the horizon of thy destiny, and rays of a new liberty, a new charity, and a new love are awakening in the hearts of men, and prophesying the coming splendor of a new day, when the sun in his fullness shall appear, and mists and shadows disappear in the coming brightness and glory! And this the song of coming generations: —

[1] We have purposely evaded the doctrinal subject of Christ's second advent, the first resurrection, and numerous important questions, not wishing to trespass on the sacred ground where various churches hold different opinions.

THE EARTH AT LAST WILL FALL INTO THE SUN. [457]

We will raise the cry of progress, forward, upward, shall we range.
We, the coming brain and sinew, must evolve a higher change ;
We will prove the world in error ; and when our palms are won,
Shall our course be wider, deeper than the course our fathers run :

For we 'll teach a purer justice, higher lift the sacred truth,
Wage a greater war 'gainst falsehood, pity more the human brute ;
We shall sing of purer visions, strike a deadlier blow at hate,
Place the man above the gold-bag, and the good above the great.

We shall closer guard the helpless, dearer hold each childish grace,
Gentler be to fallen kindred, hapless victims of our race.
Deeper shall we love, and purer ; stainless must that passion be,
Nearer to the dreamer's ideal, — boundless bliss in purity.

We 'll revive again Christ's precepts, though a church corrupt decline ;
Hold pure hearts his only temples ! teach again his truths divine.
From the shield of vampire avarice, draining human heart and vein ;
From the mask of craven falsehood, we will snatch his sacred name.

Doubt not, then, kind grey-haired doubters, we 'll not wreck all you
have made ;
Progress will not halt or linger, she will not be stopped or strayed ;
Progress forth, from night and chaos, rolled this teeming world apace ;
Progress onward, still shall bear it ; raise still yet the human race.

CHAPTER XXXVII. — CONTINUED.

PAST AND FUTURE OF JERUSALEM, WITH BIBLICAL PROPHECIES IN REFERENCE TO THE END OF OUR AGE — THE EARTH TO ASSUME A NEW AXIS AND ORBIT, AND ENTER UPON THE VENIC AGE, OR MILLENNIUM.

How true has come the fulfillment of biblical prophecy in reference to the destruction of Jerusalem, and the dispersal of the Jewish people :

> "Zion shall become as a plowed field.
> See ye the building of the temple ;
> There shall not be left one stone upon
> Another, that shall not be thrown down."

Unhappy city ! During all the period of her ancient glory, the nations had plotted to rob and dethrone this queen city of the earth. Again and again had her streets been deluged with human gore. Her spacious columns rise heavenward, but again and again they fall. Her temples and palaces, adorned with sculpture, reflecting the wealth of precious stones, embellished with gold, by the sway of empire and the torch of incendiary disappear and reappear out of the ashes of her destruction.

David, marching against Jerusalem with an army of two hundred and eighty thousand men, captures it, and makes it his capital. Sennacherib, the Napoleon of the Assyrians, enslaving nations at his chariot wheel, having made two hundred thousand captive slaves in one campaign, Phenician cities kneeling at his feet, Egypt trembling at the flash of his sword, comes upon Jerusalem, his

JERUSALEM.

final Waterloo, leaving in her streets and without her walls, a hundred, fourscore, and five thousand dead.

Jerusalem was next attacked, overwhelmed, and devastated by Shishak, king of Egypt, and robbed of the riches accumulated by Solomon.

Next came the armies of Babylon under Nebuchadnezzar, who charging and repulsed, finally captured it, and carried off a plunder such as no other city ever had to yield ; and ten thousand of her citizens trudge off into Babylonian bondage. Again the armies by night go through a breach of the Jerusalem wall, and the morning finds them in full possession.

Next, Pompey lays siege to Jerusalem, and with battering rams crushing against the wall, and catapults hurling rocks upon the people, takes the city, leaving twelve thousand dead, and Jerusalem in the clutch of the Roman war eagle.

Next Titus, seventy years after the Christian era, with his tenth legion on the mount of Olives, and giant pendulums arranged to swing great boulders against the wall and into the city ; and miners tunneling under ground make great galleries of beams and timbers, which set on fire, tumble great masses of houses and human beings into destruction and death ; a soldier, contrary to orders, hurls a torch into the temple, and it is consumed. Pompey takes ninety-seven thousand prisoners ; and Josephus says one million one hundred thousand lay dead.

Again in the twelfth century come the Crusaders against Jerusalem and the Mohammedan forces under Saladin. Against him came the armies of Europe, England, France, and combined Christendom, marching through fevers, plagues, and battle, charges and sufferings, as intense as the world ever saw ; and the carnage

began. The battering rams rolled, the catapults swung, the swords thrust, and the battle raged. The Crusaders mount the wall, a cross on every shoulder; having taken the city, they march bareheaded and barefooted to what they suppose to be the Holy Sepulcher.

But Saladin retook the city, and for the last four hundred years it has been in the possession of the Ottoman government — the Turks.

These religious crusades filled the whole period of the eleventh and twelfth centuries with horror, in which nine campaigns were directed by religious zealots, subsisting on pillage and plunder, bearing aloft the red flag of massacre. So terrible was the carnage on the taking of the city by Godfrey, that the horses of the Crusaders who rode up to the Mosque of Omer were knee deep in the stream of blood. Infants were seized by the feet, and dashed against the wall, and the Jews were all burned alive in their synagogue. In the midst of these horrors, Godfrey, bareheaded and barefooted, clothed in a pure white robe, entered the church of the Sepulcher, and offered his religious devotions at the tomb. On the following day, the captives were brought out and slain, and then followed a general massacre, in which the hewed and hacked bodies of dead men, women, and children. lay piled in massive heaps.

During these two hundred years, probably four million people perished as the direct result of these crusades; not alone soldiers, but mobs of men, women, and children, thirty thousand boys and girls led by the lad Stephen, and twenty thousand from Germany under the lad Michael, which ended in death and the Mohammedan slave market to them all. The world contains no darker

SENNACHERIB ATTACKING JERUSALEM.

picture than this which was at every step stimulated with ghost stories and holy lies; and by ingenious devices the dead were made to take part in the religious ceremonies, and the white forms of Abraham and the prophets, bearing aloft the cross, led the armies. To slay a Turk or a Jew was absolvence from all sin, and to die on holy land was the sure and straight road to heaven.

Devastated by war and dispersed by bad government, Jerusalem has gone back from a city of two million inhabitants to a tumble-down, deserted village of seven thousand souls. In truth, on the very spot where stood her ancient edifices and temples, amid valleys underlaid with broken architecture, over mounds of ruin, on the ashes and dust of her ancient glory, can be seen to-day Mohammedan gardens and spacious plowed fields.

But this same Jerusalem is again being rebuilt. Since the edict of Russia expelling all Jews from her domain and the commencement of a railroad through Palestine and the sacred city, the Jews are flocking to this their ancestral capital, by thousands, and the city puts on an air of modern, inviting prosperity.

When we reflect that Turkey, so long ranked as a great, rich, and invincible power, is rapidly becoming a bankrupt nation, tottering to her inevitable fall, mortgaged through England to the Rothschilds and the monied powers of the world, compelled to pay tribute, impoverished, and taxed to the uttermost, with English collar and chain already forged, and Russia jealous of British dominion, armed and equipped for war; Germany and France allied on either side, and awaiting the signal,— what shall be the predictions and future of this new Jerusalem?

Already the Jews have purchased large tracts of land in Palestine, and are re-colonizing the country by thousands. The signs of the times seem to point to the possible fulfillment of the predictions of Daniel, Amos, Ezekiel, Isaiah, and the prophets in the re-establishment of Jewish authority, and the restoration and rebuilding of this ancient Jerusalem.

Stop here, and see a truth of the proof of prophecy. Jeremiah tells us that —

> "Jerusalem shall be rebuilt through ashes."

Even now, in that portion of the city where new buildings are being rapidly constructed, the earth consists of great mounds of the ashes of wood and bones that have accumulated through the centuries.

> "The city shall be built to the tower of Hananeel
> Unto the gate of the corner, and the whole valley
> Of the dead bodies of the bones and of the ashes."

Explorers have been digging, and found the corner-stone of Solomon's Temple seventy-five feet below the surface. It is fourteen feet long, and three feet eight inches high, and near it an earthen jar, supposed to contain the oil of consecration, embedded with the corner-stone; also a signet ring, inscribed with the word "Haggai," to which he refers in his prophecy, saying, "I will make thee as a signet." Thus saith your prophets, O Israel! —

> "In the latter years thou shalt come into the land
> That is brought back from the sword, and is
> Gathered out of many people against the mountains
> Of Israel. Thou shalt ascend, and come like a storm
> Out of the nations, and shall dwell safely in thee.
> The sons of strangers shall build up thy walls; thy sons
> Shall come from far, and thy daughters. The Gentiles shall

Come unto thee. They shall build the old wastes,
They shall repair the desolations of many generations.
Your sons and your daughters shall prophesy. Your old men
Shall dream dreams, and your sons see visions.
The chariots shall rage in the streets, they shall jostle
One against another in the broad ways ; they shall
Seem like torches, they shall run like the lightnings.
The chariots shall be with flaming torches, in the
Day of his preparation. Who are these that fly as
A cloud[1] and as the doves to their windows ?
Therefore prophesy, and say unto Gog, In that day
When my people dwell safely, thou shalt not know it.
There shall come out of the north, riding upon horses
Against my people Israel, a mighty army.
It shall be in the latter days ; Gog and Magog,
Gomer and Lamer, Persia, Ethiopia, and Lybia.
In that day I will show wonders in the heavens,
And on the earth blood and fire and pillars of smoke.
I will remove far off from you the northern army.
There shall be a great shaking ; the mountains shall
Be thrown down. I will rain upon the earth
Great hailstones, fire, and brimstone ; the fishes of the sea
And the beasts of the field, every creeping thing,
Shall shake, when he shaketh the earth out of her
Place, and it reels to and fro like a drunkard.
A great whirlwind shall turn the earth upside down,
With a great earthquake, such as was not since men
Were upon the earth, so mighty an earthquake,
And so great. He will shake the heavens and the earth,
The sea, and the dry land ; and the slain shall be at
That day, from one end of the earth to the other.

[1] England's poet philosopher, Tennyson, in his "Locksley Hall," makes a similar prediction : —

"For I dipt into the future, far as human eye could see,
Saw the vision of the world, and all the wonders that would be ;
Saw the heavens fill with commerce, argosies of magic sails,
Pilots of the purple twilight, dropping down with costly bales ;
Heard the heavens fill with shouting, and there rained a ghastly dew
From the nations' airy navies, grappling in the central blue ;
Far along the world-wide whisper of the south-wind rushing warm,
With the standards of the peoples plunging through the thunder storm ;
Till the war-drum throbbed no longer, and the battle-flags were furled,
In the parliament of man, the federation of the world."

He rebuketh the sea and maketh it dry ; yet shall
The waters not go over the earth. The mountains
Shall depart, and the hills be removed. The beasts
Groan, the herds of cattle are perplexed ; for fire hath
Devoured the pastures, and flame burned all the trees.
The rivers are broken and dried up ; the people shall
Be pained ; all faces shall gather blackness. The earth
Shall quake. He will smite the great house with breaches
And the little house with clefts. The sun, the moon, and stars
Shall withdraw their shining ; and stars shall fall from heaven.
Be not afraid, ye beasts of the field. Be glad, ye children
Of Zion, and rejoice ; for ye shall eat in plenty and be
Satisfied. Sorrow and mourning shall flee away.
Shall I bring to the birth, and not cause it to bring forth ?
The wolf and the lamb shall feed together. I will gather
All nations and tongues, and the new earth shall
Remain before me. I will comfort the waste places,
And make the wilderness like Eden. The light of the
Moon shall be as the light of the sun, and the light
Of the sun shall be sevenfold in the day the Lord
Bindeth up the breach of his people, and healeth their wound.
For as the rain cometh down and the snow from heaven
To water the earth and make it bring forth and bud,
That it may give seed to the sower and bread to the eater,
So shall my word be. Ye shall be led forth with peace.
The mountains and the hills shall break forth before you
Into singing, and all the trees of the field shall clap
Their hands. Instead of the thorn shall come up the fir tree,
And instead of the briar shall come up the myrtle tree :
I will extend peace like a river, and the glory of the
Gentiles like a flowing stream. The voice of weeping
Shall be no more heard, or the voice of crying ; for the
Child shall die a hundred years old. Violence shall
No more be heard in the land ; wasting nor destruction
Within its borders. They shall build houses and inhabit
Them. They shall plant vineyards and eat the fruit of them.
They shall not hurt nor destroy in all my holy mountain.
I will cause righteousness to go forth as brightness,
And salvation as a lamp that burneth. And I will
Make thy windows of agates, and thy gates of carbuncles,
And all thy borders of precious stones. Thy children
Shall be taught of the Lord, and great thy righteousness."

CHAPTER XXXVIII.

THIS UNIVERSE IS THE MANIFESTATION OF GOD'S THOUGHT — THE FINITE IN THE INFINITE — MIND AND MATTER.

"The fool hath said in his heart, There is no God."

It will be remembered that in the opening chapter of this book we evaded the discussion of the fundamental constitution of matter. Let us now, from the standpoint of logic, take a new view of the creation.[1]

We are forced to the conclusion, in the study of the human mind and its relation through the senses to external things, that this mysterious and wondrous universe is not a mechanism of dead matter, but an emanation from the mind of an infinite and eternal "Ego;" and that the human senses are the simple avenues of its own divine and reflex consciousness.

We can doubt the existence of a universe of dead matter, but we cannot doubt the existence of a universe of our thoughts — a universe which appears to be — the universe which we think is. We can doubt the philosophy of atheistic materialism, but we cannot doubt the reality of an ideal universe existing in and through our senses.

Even though the universe be an hallucination, the hallucination is a reality. Even though our senses deceive us, there is truth in the illusion.

[1] If this chapter is not a demonstration, then tear up your logics, your arithmetics, your algebras, and your geometries — they are all fallacies.

We think, therefore thought is. We think a universe, therefore a universe is.

Logic cannot get beyond the platform that this universe is a thought; my thought, perchance your thought, and the thought of millions; perchance its own thought, God's thought, from whose infinity the finite springs.

Let us explore the depths of human reason and human consciousness, and from the bottom build up step by step a positive philosophy.

We are the creators of our sleeping dreams, and worlds which we people with fantastic beings; and it has been argued that life is another dream, and that the universe is the creation of our thought. We answer, This reasoning would make the "me" the all of existence; but by the limit of my thought I know that I am not the all; by my ignorance that my thought does not contain it all; by my imperfection that I am not perfect; by my beginning that I am not eternal; and this proves that the universe is not the creation of my thought, but the creation of an infinite, omniscient, perfect, and eternal Thought.

Infinity, Perfection, Omniscience, and Eternality are declared as correlatives of my imperfection, ignorance, mortality, and finitude.

There is therefore a mentality which is Infinite, Omniscient, Perfect, and Eternal, upon whose reality our existence depends, in which ours is included, and from the fullness of whose infinity, finite millions are evolved.

We are limited, there is an Unlimited; we are weakness, there is an All of power; we are ignorant, there is a Perfect; we are transient, there is an eternal; we are finite, there is an Infinite. By the correlations and antip-

odes of all things. the existence of one depending on the existence of the other, the above propositions are demonstrated.

We thus demonstrate that if the universe is a dream, it is the dream of an Existence whose mentality is the antipodes of our mentality ; that the universe is not created by our limited, finite thought, but by an omniscient, perfect, and eternal Thought.

We do not originate the thoughts which come to us through our senses in the form of stars and hills, landscapes, flowers, oceans, plains, and the pleasing phenomena of surrounding nature ; these thoughts of ours spring from the mind of the "All-embracing Ego ;" they are the real, and we are the shadow ; through our senses they become conscious of themselves in us ; they are the creators, and we are the created ; the finite rests on the bosom of the Infinite.

Though the universe be the dream of God, we bask in that dream, not as ghostly, phantom shadows, but as the fixed outgrowth of his just and eternal attributes.

Though the universe be the manifestation or materialization of God's attributes, we rest upon substance and essence in his substance and essence ; the finite with the Infinite, changing yet eternal.

We are leaves on the vines of God's thought. His thought embraces and encircles our thought. We do not rest on our own reality, but on his reality ; his self-existent, eternal thought finds a transcient, ephemeral echo in our transient, ephemeral life.

We are phenomena of independent consciousness bubbling up in the waters of eternal life.

"In God we live, move, and have our being."

Our thought hid away in the depths of his thought alone exists; his consciousness clothed with multitudinous, sensuous forms, flows through me, and through the whole universe — here, meditating within this brain; here, streaming through my veins; there, pouring its abundance into tree, shrub, or flower; there, wafting onward whole fleets of stars.

Dead, inert matter has disappeared from nature, but in its stead there rushes up the bright, everlasting flood of life and power.

In His mind, and through our minds alone, has he created the universe; in his mind, through the fixed manifestations of his eternal attributes; in our minds as a finite phenomenon of his mind; through our senses as a transient phenomenon of his consciousness; and in our activity as the manifestation of his will, has he created in us, and around us, a relative universe.

In the light of "pure reason," time, space, and dead matter have disappeared, save only as relative ideas.

All things are relative; compared with the vastness of the stars, our world becomes a minute dot; measured with the possibilities of the microscope, a drop of water becomes a stupendous world; compared to the period of the life of fleeting insects, whose years of birth and death are gone in a second, the period of our mortal life is inconceivably long: measured by the stupendous cycles of ages in the evolutions of a planet, our life is but a fleeting breath.

Time, therefore, like space, is but a relative idea; and dreams, embracing long, laborious years, are often the product of but a moment's sleep. And every phase of what we call actual existence is a thing of the mind

alone ; received in the senses, as a phase of reflection from that Mind in whom we exist.

Our ideas of weights and measurements, lights and shadows, forms, colors, etc., are necessarily relative, having no fixed reality save from the standpoint of human senses, and the scenes which environ them, as phases of the Infinite.

There are abnormal conditions of the human eye which transform and create colors, changing red to green, or white to blue, and creating constant illusions.

All objects grow small in the distance, and increase in size as we approach them, remaining large or small in proportion to the convexity of the human eye, or the capacity of sense in the beings taking cognizance of them.

The whole aspect of this universe could have been changed, as will probably be the case in that which we call death or resurrection, by the simple modification or change of the human senses.

We carry within our own being, in our faculties and senses, like the plates of a magic lantern, the measure of that universe in which we live, from the divine reality of which our nature has been evolved, and from which infinite sources we read the possibilities of infinite changes in mortal or immortal human development.

We each carry with us and within us, in our senses and faculties, the imagery of our existence, with all the lights and shadows of the spheres we inhabit, pitching above and around us dark tints of evil and ignorance, or decking wide landscapes with grandeur, and filling every detail with precious gems.

The measure and quality of a man is the measure and

quality of his universe, the good or evil, heavens or hells, which radiate from his soul, and in which he lives.

The world is beautiful to him whose nature is beautiful; who, looking out through what is within him, beholds everywhere the mirage of his own nobility. But he whose thought is full of vile passion, paints the tent in which he lives with the shadows of his own deformity, and creates within and around him a hell of distortion, loathsomeness, and pain.

"My kingdom is within you,"

was the pointed language of the Master; "blessed are the" *virtues;* for they create within you, and around you, heavens of everlasting life.

We would not be understood as attempting to overthrow the reality of things. We know that creation exists, and that we are its components. We admit the evidence of our senses and of consciousness, but we know of no means of going beyond their testimony. If underlying what we see, taste, or touch, there exists a something more material, which we cannot see, taste, or touch, its existence must remain forever beyond the comprehension of human senses and human consciousness.

We know nothing of a universe save that which is proclaimed in our senses and by our thoughts, and we have shown that our thoughts exist independent of us, in the mind of the "All-embracing Thought."

This wondrous universe, peopled with wondrous beings, is the simple, and to us physical, manifestation of God's consciousness, supported by his fixed and eternal thought, resting on his reality; from the infinite ocean of his thought all concrete, individual existences arise, and

this changing panorama of the universe resolves itself into unity.

There is but one reality, self-existent, eternal, and that is God; being above all beings, whom no one can know, and no finite knowledge conceive; well may we lift our thoughts to thee, for we can think only in thee. In thee all the problems of being are solved and harmony reigns. "I veil my face before thee, and lay my finger on my lips."

An hypothesis which does not admit of demonstration is unworthy of acceptation. The reality of the universe admits of demonstration; but it admits of demonstration only as an existence of sensation, thought, and consciousness. We rely implicitly upon the testimony of sensation, thought, and consciousness; by which, and through which, we prove, not alone our own existence, but the existence of infinitudes of sensation, thought, and consciousness, above and beyond.

We proclaim the reality of things; but reasoning on the why, whence, and wherefore, we discover that we are finite emanations in the Infinite.

Dead, inert matter has disappeared, but its place is filled with the attributes of eternal thought and consciousness: materialism, the base of all atheism, has fallen, and God appears in majesty and power; e'en though by our senses —

"We see through a glass darkly."

Barriers to a full knowledge of the Infinite are these finite human senses; these, alone, constitute our humanity, intervening between us and God.

An unknown and unknowable substratum has been assumed to underlie our ideas and conceptions of matter,

a something supporting realities, to which accidents adhere; this is an imaginary pigment, worse than useless — a pernicious doctrine, and the base of atheism.

If you understand by matter that which is seen and touched and is proclaimed by the senses, like the objects seen, touched, and tasted in a dream, then we say matter exists; but if you understand by matter a something underlying thought and sensation, which cannot be seen or touched, of which the senses cannot, do not, inform you, then we deny the existence of matter.

We must confine ourselves to the evidence of the senses, and that which impresses the senses are thoughts or things themselves.

We know that creation exists, but it exists in the mind and through the senses, according to its environments, as a phase of that Mind whose thought is thus reflected, in the infinite ocean of whose thought we think, and in whose life we live.

The human mind cannot possibly go beyond its own ideas; it must stop at the limit of the idea; it may weigh and measure, analyze and describe an object; but the weight and measurement, analysis and description of that object, is the weight and measurement, analysis and description of its own ideas only; and these ideas of objects are the objects themselves.

Science may multiply names, and classify its endless nomenclature under the headings of various sciences, but its names are names of ideas only, its classification a classification of ideas only.

Science cannot get beyond the platform that this universe is a universe of ideas, that this sublime panorama is a panorama of ideas; and here science beholds

God. This universe is a thought, an emanation from mind, the simple idea of God.

Ideas eternal constitute actual existence; the thought of Divinity is eternal reality; and eternal reality the supreme Divinity.

How sublime becomes the picture, how the mind bends in adoration when it discovers that this universe is God — his thought animate with form, and clothed with reality!

Above, see the mighty constellations of moving stars; around, see the landscapes, oceans, flowers, the changing seasons, the perpetual phenomena of life, dying yet renewed forever; all upheld by the fixed and immutable attributes of God; the manifestations of his fixed, eternal, and unswerving will; resting on the bosom of his consciousness.

Skepticism has been the invincible giant, the insatiable destroyer; he has strewn the cemetery of the past with corses of dead religions; at his appearance the Christian religion trembles in its strength.

Idealism has met skepticism on the fair field of science, grappled with him under the black flag of conflict, and yonder lies the prostrate giant.

Idealism would snatch from the mouth of Ingersoll, "An honest God is the noblest work of man," and hurl it back as the unanswerable evidence of his existence.

From the sublime poetry of Plato down to Germany's great philosopher, Kant, theology has ever taken refuge behind idealism when waging successful war upon its implacable foe.

The great Frenchman, Descartes, beaten by the skeptics, unable to prove the reality of things, unable to

prove his own existence, from the standpoint of material philosophy, finally hurled back the crushing yet idealistic syllogism,

"*Cogeto ergo sum.*"

(I think, therefore thought is.)

I think, therefore I am. Infinity and perfection are declared as correlations of my imperfection and finitude. God therefore exists. My doubts of him prove him, which when I have considered, demonstrate his existence as absolutely as my own.

What matters it to science if it be proven that ideas alone exist, if that which we call matter is proven to be eternal thought? Phenomena will remain the same, mathematics will calculate, logic will analyze, mechanics combine, chemistry divide, philosophy contemplate, art create, and science classify. A universe as we see it, as it presents itself to our senses — a universe of ideas remaining the picture, is unchanged. The rose will unfold its leaves, determine its form, impart its color, and diffuse its fragrance; viewing it as an idea, — its own idea — the idea of its environments — God's idea, — we can comprehend how it becomes a human idea. If it is a thought, we can understand how it becomes a human thought.

This universe is a stupendous reality; and every iota, thought, or atom is an independent, conscious factor in an infinite sea of thought and consciousness. It is God's synthesis; finite, human thought rests upon it, is environed by it, springs out of it, and is identical with it.

Man by his thought can create only in so far as his existence environs other existences. He may attempt to create things in the abstract, he may imagine Milton's wars in heaven, or Shakespeare's tragedies; he may in

"THE SUN, WITH HIS RAINBOWS AND MIRAGE PICTURES IN THE HEAVENS." [481]

imagination locate rivers, project mountains, and build castles in the air; he may by his finite, fleeting thought reflect transient mirages from God's infinite, eternal thought; but resting on a greater reality, his dreams are but reflections and shadowy phantoms from that Reality which sustains and supports him. Man is a created,— the antitype of his environments,— and not a creator; and his finite, human senses chain him to his proper sphere. In the eye, the ear, the touch, the taste, God speaks. His thought becomes our thought, we rest on his bosom, environed by his consciousness, held fast in his embrace; through the eye, the ear, the touch, the taste, we drink knowledge from an infinite source, and feel the truth of his thought, which alone is real.

Man, isolated from all real phenomena, removed from God's thought by the paralysis of the senses, when the eye no longer sees nor the ear hears, nor touch feels; when all the avenues of God's thought are shut, and man lives alone in the greatness of an isolated existence, apart from God; when all the senses are dead and the mind lost in unconscious sleep; here weak finite man creates and builds universes, sure and fixed as God's creation, and his fleeting dreams are true, his fantastic dream-creation a twilight miniature of God's creation. But when the human senses are awakened, and the avenues of God's thought opened; when the eye sees, the ear hears, the touch feels; when God pictures his thought in every human environment, man's fantastic dream-creation is superceded by the more fantastic reality of God's creation. Man being finite and ephemeral, his dream-creations are finite and ephemeral. God being infinite, immutable, and eternal, his thoughts are immutable, infinite, and unchangeable.

Man's very existence is but a transient, ephemeral ray from the sunlight of God's thought, a transient gleam, a mingling of pain and pleasure, a growth, perihelion, and decay; a beam of light sweeping across the disk of God's consciousness from the cradle to the grave.

"He cometh forth like a flower that is cut down;
He fleeth also as a shadow, and continueth not."

Still he is a part of the universe, a part of the changing yet eternal thought which, governed by fixed and immutable attributes, reflects and fills immensity and eternity.

"A beam ethereal, sullied, and absorbed;
Though sullied and dishonored, still divine!
Dim miniature of greatness, absolute!
An heir of glory, a frail child of dust;
Helpless, immortal, insect, infinite!
A worm, a God! I tremble at myself,
And in myself am lost. O, how reason reels!
What a miracle to man is man!"

CHAPTER XXXIX.

GATES AJAR — CONTINUATION OF THE PRECEDING CHAPTER — THE LIFE BEYOND THE GRAVE.

"If a man die, shall he live again?"

Were we for the first time to consider the scene of death, how confused would be our ideas in regard to the great mystery before us. "What is it?" we would ask, and how anxiously would we watch for some signs of waking, not giving up hope, until decay began its ravages on the form before us.

And then, as we should consign to the earth the one so recently among us, a moving, breathing, speaking man, now a mass of decayed matter, we should feel that we buried there, not the body only, but the whole man.

Physical nature utters no voice to tell us otherwise; she emits no light to illuminate the grave; darkness and silence rest there, till the light of revelation shines upon it, and God proclaims man's immortality.

Reason cannot explore the mysterious depths; philosophy contemplates a dark, impenetrable mystery; and science shrinks from the great unknown beyond the veil.

Yet up from the depths of our own souls wells the heaven-born hope of immortality; the divine in our natures, — thoughts and feelings, — numberless, nameless, unutterable, unfathomable emotions within us proclaim —

"It is not all of life to live, nor all of death to die,"

that in some mysterious way we shall live beyond the tomb. These physical senses cannot comprehend other universes, other phases of God's thought, future worlds, no less real than this, better and brighter beyond the veil.

Wherever friendship gazes upon the dead form of friendship, wherever affection is separated from affection by the hand of death, wherever love kisses the pallid lips of love, there are gates ajar; and mortality sees the shadow and feels the impress of the immortal.

There are gates ajar in memory's tears, in flowers on graves, in epitaphs on tombs.

The deep discernment of the soul's embryotic, inner senses, — eyes which see, and ears which hear, and a faith which no argument can overthrow — all proclaim that back of the shroud, and the pall, and the bier, back of the mold and the decay, there are worlds and joys and existences, lives, loves, and realities.

Immortality is written on every tablet of the human heart; it is proclaimed in every deep emotion of our natures; it is written in the unfathomables of the stars; it is whispered in the winds rustling back voices of the departed; it is echoed in the deep and silent sea; it is felt in solitude and in darkness; it is spoken aloud in dreams; — while memory lasts, while affection clings, while love responds, while the human heart endures, there will ever remain the heaven-born hope of immortality.

"Lo, the poor Indian! whose untutored mind
Sees God in clouds, or hears him in the wind;
His soul, proud science ne'er taught to stray
Far as the solar walk, or Milky Way;
Yet simple nature to his hope has given,
Behind the cloud-capped hill, an humbler heaven,

"Immortality is Proclaimed by Every Deep Emotion of Our Natures ; It is Spoken Aloud in Dreams." [487]

Some safer world, in depth of woods' embrace,
Some happier island in the watery waste,
Where slaves once more their native land behold,
No fiends torment, no Christians thirst for gold :
To be content his natural desire,
He asks no angel's wing, no seraph's fire ;
But thinks, admitted to that equal sky,
His faithful dog shall bear him company."

What mean the sayings which they tell us who have been restored from the near approach of death, brought back from drowning, and severe illness ! — which they tell us who from fright or impending danger become physically blind, deaf, and dumb, conscious of nothing, save the detailed history of their lives, memory repeating the past, and giving back all its details and thoughts, so that in a moment they have seemed to be wrapped around with the repetitions of their lives, with all of its shadings of good or bad, the good wrapping them round with a halo of glory, and the bad filling conscience with remorses, reiterated and repeated with new freshness and vividness ?

There are other senses in the soul of man lying dormant. These eyes and these ears are the mediums of our mortal and present state, the chrysalis shell of the soul's humanity, by means of which God has created around us this present relative world. There are other eyes and other ears and other senses lying dormant in the soul of man — embryos — dim rudiments — the shadows of what shall be,— a budding faith in the form of hope, waiting for metamorphosis and development — waiting for that fuller beginning beyond the tomb.

We have shown in the preceding chapter that this universe exists alone in our thoughts, through our senses, as a phase of the Infinite Mind, in whom we exist.

Barriers to a knowledge of other and future states are these finite senses; these constitute our humanity, and limit the possibility of the development of the soul's inner senses.

The grave, therefore, is the gate, through sleep and the dark river, to a new birth, a new world, a new universe, and a new sphere of action. E'en the champions of infidelity cannot stifle that which their deep nature proclaims, and Ingersoll, overpowered with grief at his brother's grave, cries,—

> "In the night of death, hope sees a star, and
> Lingering love almost hears the rustle of a wing."

Beneath this human nature, and the relative surroundings created by and through our senses, there is that in man, deep hidden in the recesses of his undeveloped nature, which is eternal, and which will be the germs of his future unfolding. We have shown in the preceding chapter that this universe is a phase only of the infinite thought; there are other universes, other metamorphic senses to be awakened in the soul of man, other and future phases of God's thought, in the mansions of whose life we shall live.

In the panorama of this life and this universe, all things are relative. The physical phases of this universe, from the standpoint of human sense, are as mortal and shadowy as the shadowy mortality of man — they fall together — in the obliteration of mortal sense, all nature dies. The whole physical universe dies in the death of the senses which take cognizance of it, which perceive and create it. The sun and the stars, the landscape with its flowers, become alike stranded in the fading eye

and dying sense. Time and space, forms and colors, weights and measurements, have an existence alone in these mortal senses, as a phase of God's thought, producing this mortal universe, and this mortal embryotic state of man. Beyond the tomb in the resurrection and metamorphosis of every latent force, when the world and time shall be no more, having finished their course; in the seething, searching flame of judgment, we shall perchance awake from this dream of earth to find it, with all the scenes of this present universe, and the stars of this upper sky, lost in a point on the shore of an infinite sea of life.

Says Carlyle: "To the eye of vulgar logic, what is man? — an omniverous biped that wears breeches. To the eye of pure reason, what is he? — a soul, a spirit, and divine apparition; around his mysterious Me, — under all these wool-rags, a garment of flesh or of sinews, contextured in the loom of heaven. Deep hidden is he, under that strange garment, amid sounds and colors and forms; as it were swathed in, and inextricably overswathed, yet it is sky-woven and worthy of a God.

"Know of a truth that only the time-shadings have perished, or are perishable, that the real Being of whatever was, and whatever is, and whatever will be, is even now and forever. Are we not spirits that are shaped into a body, into an appearance, and that fade away again into air and invisibility?

"Oh, heaven! it is mysterious, it is awful, to consider that we not only carry each a future ghost within him, but are now in every deed ghosts; these limbs — whence had we them? this stormy force, this life-blood with its burning passion — they are dust and shadow,

a shadowy system gathered around our Me, wherein through some moments or years the divine essence is to be revealed."

The panorama of the world above, beneath, and around us, including our own being, is but a finite, mortal phase of God's thought amid unperceived, infinite mansions of his life. This human life is draped with surroundings, mysteriously fixed in the senses, seen, heard, felt; drapery behind drapery, in endless perspective; with radiant changing colors, forms and sounds, lights and shades, wondrously inwrought in the camera plates of the human senses. These finite mortal eyes, and these finite mortal ears are God's camera plates of human life, from which the human soul projects the outward universe like pictures thrown from a magic lantern. Changing the human senses, as mortals to spirits change, will change the world and scenes around us; while new senses, unfolding in the soul of man, will create for him other worlds, and other universes — other phases of God's thought — future worlds, brighter and happier beyond the tomb.

Man is encompassed, environed, wrapped around with symbols. Things visible are but garments clothing higher, celestial, invisible.

Behold the world rocking and plunging among the stars, within her bosom smoldering fiery passion, and without green meadows, whispering zephyrs, and quiet sunshine; behold the sun in his cloud-couch of crimson and cloth of gold, rising from the silver of waters, reflecting from his glance rainbows of blended colors — look first upon the imagery — these outward hangings of the Infinite, then go beyond the scenic shadings, lights and colors, forms and sounds; put on for a moment a spirit

FAITH, HOPE, AND CHARITY.

"It Hath Not Entered Into the Heart Of Man to Conceive What We Shall Be."

garb as eternal as He who occupies this changing and many-pictured throne.

"Heaven from all creatures hides the book of fate,
All but the page prescribed their present state ;
From brutes what men, from men what spirits know,
Or who could suffer being here below ;
The lamb thy riot dooms to bleed to-day,
Had he thy reason, would he skip and play ?
Pleased to the last, he crops the flowery food,
And licks the hand just raised to shed his blood ;
Ah, blindness to the future, kindly given !
That each may fill the circle marked by heaven."

At death, in the dissolution of the senses which constitute this life, the now existing, embryotic germs of the soul's inner senses shall unfold, through which and in which, we shall bask in the sunlight of a new life, explore new heights and new depths, and revel in the sunshine of a new universe, the nature of which —

"Eye hath not seen, nor ear heard, nor hath
It entered into the hearts of man
To conceive what we shall be ; but we shall
See Him as he is, and be like Him."

Even though we cannot comprehend the exact condition of the future, let us dispel every wavering doubt arising from the transitory shadows of earthly things. How vain the infinite plan or object of life without this final reckoning of the good and bad in every nature, this final righting and shining of every human virtue !

"It must be so — Plato, thou reason'st well —
Else whence this pleasing hope, this fond desire,
This longing after immortality ?
Or whence this secret dread, and inward horror

Of falling into nought? Why shrinks the soul
Back on itself, and startles at destruction?
'T is the Divinity, that stirs within us;
'T is Heaven itself, that points out a hereafter,
And intimates eternity to man.
Eternity! thou pleasing, dreadful thought!
Through what variety of untried being,
Through what new scenes and changes must we pass!
The wide, th' unbounded prospect lies before me;
But shadows, clouds, and darkness rest upon it."

Poets and philosophers have delighted to compare this earthly existence in its relation to the next, to the analogies existing between that embryonic existence which we once lived, and which is now forgotten, but from which dim beginning came this mortal life.

"This is the bud of being, the dim dawn,
The vestibule, the twilight of our day;
Life's theater as yet is shut, and death,—
Strong death, alone, can heave the massive bar,
This gross impediment of clay remove,
And make us embryos in existence free;
From real life, but little more remote
Is he, not yet a candidate for light,
The future embryo slumbering in his sire;
Embryos we must be, till we burst the shell—
Yon ambient, azure shell, and spring to life—
The life of gods! Aye, transport, and of men!"

Taking now the Bible, we read the yet more sublime language of Paul. "So also is the resurrection of the dead. It is sown a natural body, it is raised a spiritual body." As we have borne the image of the earthly, we must also bear the image of the heavenly; for this corruptible must put on incorruption; this mortal immortality. "Then shall be brought to pass the saying that is written, Death

is swallowed up in victory. O death, where is thy sting? O grave, where is thy victory?"

"When the years of earth are over, and the cares of earth are done;
When the reign of time is ended, and eternity begun;
When the thunders of Omniscience, on our wakened senses roll,
And the sky above shall wither, and be gathered like a scroll;
When among the lofty mountains, and across the mighty sea,
The sublime, celestial bugler shall ring out the revelry,
Then shall march with brightest laurels and with proud victorious tread,
To their stations up in heaven, Christ's great army of the dead."

CHAPTER XL.

MEDITATIONS IN THE NIGHT — BIRTH, GROWTH, AND DEATH OF WORLDS — HEAVENS AND HELLS — GOD'S THOUGHT AND THE GLEAM OF HUMAN CONSCIOUSNESS — A CONTINUATION OF THE TWO PRECEDING CHAPTERS.

"In my Father's house are many mansions."

We have found axial and orbital motion of the earth and all planets, to be due to the rotary motion of their atmospheres, under the influence of the sun. There will come a time when the earth's atmosphere shall have been exhausted — its oxygen, nitrogen, and carbon, through vegetable growth, stored away into the solid crust of the globe.

Vegetation feeds on the elements of air. If a pound of dry earth be placed in a vase, and germ trees planted therein, and supplied with water, they will grow and come to weigh many pounds; while the weight of inclosed earth will not be sensibly diminished. Thus it is the earth's atmosphere is slowly but surely being devoured by the waving forests and green verdure of all the landscape; the elements alike of water and air — oxygen, hydrogen, nitrogen, and carbon — are crumbling by this invisible process of combustion into the ashes of the earth. And in the ages of the future, the earth will have become a bleak, barren waste, as desolate as the moon, without oceans or atmosphere, the picture of forgetfulness and solitude, awaiting her final dissolution and resurrection in the sun.

MEDITATIONS IN THE NIGHT. [499]

All things grow old and die. The same inexorable destiny that awaits each and all of us awaits the great mother of our life, the world herself, and all worlds; they will become as dead as the tribes slumbering in their bosoms.

When the earth becomes airless, waterless, motionless, lifeless; when the white bosom of her oceans shall heave no more with love, and her palpitating winds lie down in death; all that live shall have shared her destiny; the countless races of moving things which inhabit her hills, her plains, her air, her seas, shall have made their bed with her, all in one mighty sepulcher.

> "Yet not to thine eternal resting place
> Shalt thou retire alone; nor could'st thou wish
> Couch more magnificent. Thou shalt lie down
> With patriarchs of the infant world, with kings;
> The powerful of the earth, the wise, the good;
> Fair forms and hoary seers of ages past,
> All in one mighty sepulcher."

When the earth's atmosphere shall have been exhausted, she will no longer revolve on her axis, and oscillate around the sun with an impetus and life of her own; but carried still by the force of momentum around the sun in his ether currents, she may for a period, like the satellite which revolves around our earth, roll a silent spectator, reflecting his light, until she falls into his fires.

'T is night. I sit in my window, looking up into the bright canopy of the sky. The constellation of Canes Venatici is moving toward the horizon. "The path of the ghosts," — the Milky Way, like a rainbow of fire-flies, sparkles athwart the sky. I gaze steadily into the faces of these million suns. Answer me, ye worlds; are

you fathers of families that still cluster around you, the architype and source of that life which perchance clings upon their bosoms? do you think and feel? but the stars twinkle on as before.

I compare these moving constellations of stars to the destiny which fates human thought and human action. I behold Napoleon with his marshaled armies under the Pyramids, moving like constellations of stars. I behold the genii of the world, like beacon lights, radiating in the ages. I behold an ignorant sea of human passion making them martyrs. I look again, and see dens where purity is crushed, and where crime bends low and growls. Across the way, in yonder house, is a father in sickness, surrounded by a family of little children; a few angel women are there, administering to want and distress, like the women who followed in the night and watched in darkness at the door of the sepulcher. The great head of the good old family physician looks placid as the rock of adamant, while deep within surges a mighty sea; he is fighting back death with the keen scalpel of science. I behold men acting out their inherent natures, rolling in their orbits, like the stars of this mighty sky, driven onward by destiny. Back from the depths of my meditations comes the echo — voices rolling back from the stars — "crawling worm — globule of our life's blood — mold on our bosoms — finite thing, we are infinite." Meditating on this infinitely varied sea, I am forced to believe with Pope, that —

> "All are but parts of one stupendous whole,
> Whose body nature is, and God the soul."

Only that part of the universe is visible to human senses which environs and creates human senses. With new developments in the soul of man, when the chrysalis-

shell of this mortal coil shall be shuffled off, and man beholds with other eyes and hears with other ears and contemplates with other senses, the whole imagery of outward things will have been changed.

This mortal existence is on the lining, and not on the true surface of God's creation. All things are to man but illusions, deceptions, phantoms ; transformed and mystified through these opaque crystalline retinas and these ear-drums, changing the true aspect of sounds, colors, forms, and objects, modifying and transforming the univers around us.

When we step out from the lining into the reality, and behold things as they are, the universe will present a new and totally dissimilar aspect. The opening doors,— dark waters intervening, the tomb and the shroud,— will disclose new phases and realities of the infinite creation of God's thought.

"In my Father's house are many mansions."

Could we behold the universe as it is, in all its varied aspects, as God sees it, perhaps objects of our admiration, which we had almost worshiped, in the form of men, great and good, would appear in their abstract attributes ; and instead of these decaying symbols of dust, love might take the form and associations of love ; and every grace and charity, every song and beauty, appear in its true light and true form, and every evil shrink back, with muttered imprecations and like associations, clothed in forms as monstrous as its villainy.

Could we view the universe as God sees it, from its right instead of its wrong side, as it is, instead of by the hallucinations of physical senses, and their false mirages of colors, sounds, and forms, hiding from us the true aspect and glory of things, thereby creating this false exist-

ence and probationary life — could we view the universe as God sees it, we might behold, in this Milky Way of stars, stupendous aggregations of evil, and like aggregations of virtue with their million-clustered joys.

> "The things which are seen are temporal, but the things
> Which are not seen are eternal. Now we see through
> A glass darkly. There are celestial bodies, and
> Bodies terrestrial. And we know that if our
> Earthly house of this tabernacle were dissolved,
> We have a building of God, an house not made
> With hands, eternal in the heavens."

John Wesley, I have been reading your sermons; and Swedenborg, my meditations combine your thoughts. This universe, visible or invisible, is the surging sea of heaven and hell. Thought is immortal; it clusters together by the law of affinity, likes and dislikes, assuming form and clothed in a garb corresponding with character. This universe is a universe of thought, sensation, passion, and feeling, the surging sea of heaven and hell. The sun, reflecting a halo of glory, is the embrace of life and love we cannot comprehend; while devils fill the realms of "*Hades*" with forms monstrous as their villainy. This human sea of white and red globules, of virtue and sin, must break the shell of this fleshly coil and the false mirage of these physical senses, and take form, with place and associations, corresponding with their thoughts.

Even as the white and red globules of blood in our veins are each a perfect world of life; even as these globules perish in the brain and die in a steady stream, whose life leaps out in the thoughts we are thinking and the emotions we are feeling, so this stream of human globules, circulating in the veins of higher celestial, are falling in perpetual death; supplying the great brain

of fire and ether with forms high and low; bliss unspeakable, or with pain. This human flood of a perpetual dying leaps out into the objective, and man assumes the form and associations of his thoughts and feelings. To the pure in heart, death is the leaping out into a life grand and full of glory; while men of base passions will find themselves in their thoughts embodied; the warrior in the smoke and strife of war; and the miser, with his wealth, embodied in his thoughts and fears, will use all the cunning of trade, and in his poverty beg for a drop of water; and all that is bad in human passion, born of the fiery elements of this flesh, shall leap out into weeping.

Thought, feelings, and propensities are immortal — sleep does not destroy, and death cannot annihilate — e'en though in the grave man remains unconscious — dead to the possibility of his resurrection — until the fiery elements of the sun shall touch the slumbering forces, and every latent energy spring to life before the bar of judgment. The sleep of death, whether it be a second of time, or the long lapse of slow rolling ages, will be to immortality and to God the same; — beyond the grave — all the same — in that fuller life, where time and distance shall be no more.

Evil thoughts and feelings may take form in the metaphorical language of Milton:

"Of frozen desolation and hissing fiery seas,
Rocks, caves, lakes, fens, bogs, dens, and shades of death;
Where all life dies, death lives, and nature breeds,
Perverse, all monsters, all prodigious things;
Abominable, unutterable; and worse than fables
Yet hath feigned, or fear conceived; gorgons, hydras,
And chimeras dire. The beams of the sun it hates;
And hatred takes form, and shape; and with associate
Legions, fill vast regions of space, like fiery balls."

This universe is a universe of thought. Man is but a ray of consciousness hid within a symbol on the disk of eternal being, a struggle of principles good and bad. This universe is the surging sea of heaven and hell.

This map of humanity is a map of forms and symbols; these human beings are the shadows where play the eternal passions, where God's fleeting, feeling emotions take form, where the good is happiness and the evil pain, where principles are struggling for associate principles, where affinities and repulsions, vice and virtue, love and hate, are sifting out heaven and hell.

This Milky Way of stars is the path of mighty domains where thought takes form, where virtue clusters in the embrace of virtue with a glory outshining the sun; and this Milky Way is the path of infinite gradations, of migrations and transmigrations, where the bad is eternally gravitating towards deeper hells and assuming more monstrous forms, where virtue is climbing upward to brighter suns and a happiness more exquisite.

From the union or disunion of elements which compose worlds, to their complexities in living beings, and dissolution at death; when the grain is gathered into the garner and separated from the chaff, in which the conflict of the good and bad in our natures divides, and new associations take place higher and lower, this Milky Way of stars with their eternal evolutions of birth and death, mingling and separating, is the path of man's immortality, and the infinite road of new being, extending from the depths of sin and pain, to the heights of virtue and glory.

"The bell strikes one; we take no note of time,
But from its loss; to give it then a tongue
Is wise in man; as if an angel spoke,

"'Tis Night; I Sit in My Window Looking Out Into the Bright Canopy of the Sky." [507]

I hear the solemn sound. If heard aright,
It is the knell of my departed hours ;
Where are they, with the years beyond the flood ?
My hopes and fears start up alarmed,
And o'er life's narrow verge, look down — on what ?
A fathomless abyss, a dread eternity,
How surely mine ; and can eternity belong to me,
Poor pensioner on the bounties of an hour ?"

Before me, in the stellar depths, in this boundless sea of symbols, I read, as it were, inscriptions on the arched ethereal dome, as if on massive doors to infinite, eternal realms of thought and being ; the river of death between, — the tomb and decay — massive doors in this vault of symbols, shutting mortals out of heaven or hell.

And here in the night, with solitude behind me, and this immeasurable Milky Way of stars above and around me, I am not alone : methinks I catch the inspiration of voices, deep intonations of the stars, speaking each eternal principles ; and in their scintillating colors behold clustered attributes and shadings of the Infinite, gradations and symbols of eternity, from heaven to hell.

I worship here, in this temple of God, in this immeasurable universe of stars.

I worship here ; not as that French high priest of philosophy, August Comte, would have me, the decaying, crumbling, mortal forms of man, however much genius has made it itself admired. I worship attributes, in the abstract ; justice, mercy, goodness, love. I worship the song, the music, and not lips of clay reflecting it. I worship heroism and precept, and not the man receiving and acting it. I worship truth and light in its glory, and not the skull of clay it has lit and illumed. I worship virtue and purity, and not the human glass reflecting a few rays of the scintillating brightness.

I worship God, and the abstract principles of eternal being, to the eye visible in this infinite universe of symbols,— oceans, mountains, rivers, flowers, the genii of the world's history,— and here in the night, above and around me symbolized in lights and figures — stars.

> "There is a pleasure in the pathless woods,
> There is a rapture on the lonely shore,
> There is society where none intrudes,
> By the deep sea, and music in its roar ;
> I love not man the less, but nature more,
> From these our interviews, in which I steal
> From all I may be, or have been before,
> To mingle with the universe, and feel
> What I can ne'er express, yet cannot all conceal."

Behold a comet in the northern sky ! You have before you a mighty destiny, a future of world-history of life and love ! You will form a crust between central expanding heat and a circumference of condensing cold. You will repeat the history of the earth's forming shell, wrapping a sea of fire with ribs of rock, with an exterior of vapor and ethereal gases, upon which a sun's rays can act, establishing axial and orbital motion. You will then move with a life of your own, settle down as a staid and formal world, rotating with slow dignity around some sun, the choice of your affinities and attractions, by whose genial warmth you will continue to develop, and roll on your grand destiny through cycles of ages, lifting high cloud-capped mountains, with intervening oceans, hills, and valleys, clothed with verdure and animate with life, with thought, and love.

You, too, shall become venerable with age. Your crystal streams and billowy oceans will in time disappear, and your winds lie down in death ; as you, perchance,

still move in the ether currents, carried on the shoulder of a comrade — the lifeless moon of another planet, until you fall together into the vortex of fire and ruin.

Comets are carried in the ether currents, radiating outward from the rotary motion of great suns. Stupendous ethereal wheels revolve around all suns, impinging on each other; while comets are carried in the wakes between. And it is not strange that you sometimes wander from the zone of your parent sun — carried in the gulf-streams between suns and systems, through varied paths of the complex universe.

Your chaotic elements will surge, amid fire and water, world-life and progress, virtue and sin, pleasure and pain, for cycles of ages, evolving the glory of immortal purity; while the dross of your elements will become accumulated for deeper hells.

Comets and worlds, like the tiny insects that flutter in their brief but happy existence; like every blade of grass that shoots up to-day and is cut down to-morrow; like every thought that springs from the brain of man and takes on activity; like every emotion of virtue which brings happiness, or every dark passion attended with pain,— all repeat the same story — the story of all the stars — a story of birth, changes, and death — a mingling and a separating.

Comets do not originate in, or belong to, our solar system: they are wanderers from remote regions; and the nebulæ, seen by the telescope in Orion, have drifted in from regions remote from the Milky Way.

But there was a time far back in the ages when, successively, the earth and all her sister planets were comets. And the sun itself has been built up of an infinite number of lesser worlds that have evolved from nebula, through

comets, to planets, lived out their age, and fallen into his fires.

Organization is still forcing itself into remote regions, and evolving the unconscious attributes of space.

Let us, in imagination, penetrate the boundaries of the universe, and explore the regions between the twilight and the shadow, where omniscient God in solitude reigns and broods. Yonder, stupendous, shadowy outlines of ethereal nebula! Nearer, the dim markings of future Milky Ways, with here and there fiery centers of future suns! Nearer, comets are wheeling in their ellipses, forming planets, which live out their age, and fall into a central vortex of fire.

Look yonder, in the other direction, at the antipodes of creative immensity; see old age, decay, and death of worlds; see stars falling like snowflakes in furious storm, and sounding the blast of ruin in the cyclone of elements, with fire and tempest.

> Making to coil and flash, in terrible attempted war,
> The devils of resounding hell, and Satan, sin, and death
> Confound; amazement confronts, and helpless recoil
> At the magnitude of God's omniscience; while he
> Spreads out the heavens like a molten looking-glass.

This universe is not the product of two conflicting powers, the one good and the other bad — the battle ground and dual creation of gods and devils with equal power struggling for the mastery, and each attempting to excel the other in the prodigious variety and extent of their creations; we have borrowed such ideas from the Druids, whose religion can be traced back through Rome and ancient Greece into Turkey and China.

This universe is not the struggle between a god in equal power, contending with a devil, but the product of

infinite goodness and love, — the creation of one omnipotent, omniscient, and omnipresent Divinity. In the language of Isaiah, —

> "I have stretched out the heavens, and all the
> Hosts of them. I have made the earth, and created
> Man upon it. I form the light, and create
> Darkness. I make peace, and create evil.
> I am God, and there is none beside me."

This universe is God — his thought — clothed with form and animate with activity; and the existence of every principle depends upon its opposite or counterpart. Without a creation, there could be no void. Without the heights, there could be no depths; without the vast, no small; without the infinite, no finite. Without darkness, there could be no light. Without pain, there could be no pleasure. Without malice, there could be no charity. Without hatred, there could be no love. Without villainy, there could be no justice. Without sin, there could be no virtue; without devils, no seraphs; without the shadows of a hell, no glory of the heaven.

If we had never been weak, could we appreciate strength? If we had never suffered, could we comprehend happiness? If we had never been in the darkness of error, could we realize the truth? If we had never been the victims of sin, could we be righteous? If we had never felt the pangs of sorrow, could we pity? If we had never felt the need of forgiveness, could we forgive?

> Every virtue is its own reward,
> And every sin its own punishment.

Infinite love has fixed the school of life, with all its weakness, its error, its passion, its painful lessons, its

conflicting emotions, its dark clouds of sin, its inhumanity, vice, and crime.

Infinite love has placed humanity in the surging sea, amid the shadows, in the billows, amid the darkness.

Infinite love has fixed the pangs of pain, the shriek and cry of agony, and the dying groan; — and this is the greatest of all virtues, "charity," e'en towards the vilest and darkest of God's creatures; — in the surging, seething, painful sea of human passion, human error, human weakness, with all its vice and crime, under the rod of chastenings, the stripes of sorrow, and the pangs of remorse — from the groan, the shriek, the agony, infinite love, through "two eternities," is working out an eternal weight of virtue and of glory. There is nothing created in vain; the self-chosen path of righteousness and happiness is the end and ultimatum of things. But the heights and the depths, the lights and shadows, will remain forever.

It was the father of Unitarianism, Dr. Channing, who said, "If there is a devil, God made him, and that out of the devilish part of himself;" in other words, the devil, feigned and feared, together with the fires of his hell, are but the rods of God's chastenings and the clouds concealing, for our good, the heights of infinite and eternal love.

> And as luster, darkness adds to light;
> As seems the better best, when with the worst compared;
> So virtue more divine appears with gusts of hell
> Careering by its side; and thought will gaze,
> And tearful moan, that purest innocence
> Could reach such horrid depths by dalliance
> With the leprosy of sin; while every spark
> Of virtue born in hell, with quick affinity
> Upward darts. Like Raphael's enchanting beauty,

Chained in oil, made glorious by contrast
Of slimy serpents on which she treads;
So God in glory becomes more radiant
With devils under his feet; the heights of virtue
More blessed, hovering o'er the seas of sin.

This universe is God — his thought — clothed in form and animated with activity. Man stands midway from nothing to the Deity, midway between the depths and the heights. He feels a sting of pain and a gleam of pleasure. He hears the groan of hell and the song of heaven. He catches a gleam of life, and sinks in a pang of death, but not the death of annihilation; this death he cannot die. Elements dissolve; virtue mounts upward, and sin goes downward; "the grain is separated from the chaff;" immortality flashes forth in long-drawn, quick succeeding grandeur, new rays in the sunlight of God's thought — a consciousness and a forgetfulness — a fire-fly flashing in the night of God's eternity.

In the language of Carlyle, "Generation after generation takes to itself the form of a body; and forth-issuing from Cimmerian Night on heaven's mission appears. What force and fire is in each he expends, one grinding in the mill of industry; one, hunter-like, climbing the giddy Alpine heights of science; one madly dashed in pieces on the rocks of strife, in war with his fellow: — and then the heaven-sent is recalled; his earthly vesture falls away, and soon even to sense becomes a vanished shadow. Thus, like some wild-flaming, wild-thundering train of heaven's artillery, does this mysterious mankind thunder and flame in long-drawn, quick-succeeding grandeur, through the unknown deep. Thus, like a God-created, fire-breathing spirit-host, we emerge from the inane; haste stormfully across the astonished earth, then plunge again

into the inane. . . . But whence? — O Heaven, whither? Sense knows not; faith knows not; only that it is through mystery to mystery, from God to God."

Man is not the small being he seems. He is as broad as the sweep of his thoughts, as high and as low. He is that portion of God's universe, of God's manifest thought, which he receives and comprehends — a broad, wide being, chained to mortality by a point of human nature. The surrounding hills and stars — the objective thought of God — find a transient, ephemeral echo in his transient, ephemeral life; but his thoughts live in the bosom of the universe when this mortal coil shall have vanished into empty air and invisibility. The human mind is an emanation from God — a point of independent consciousness, and with him eternal, existing even now in him, undisturbed by life or death. The abstract principles and emotions of love, justice, mercy, philanthropy, heroism, and charity will thrill through all eternity.

An illustration of immortality is observed in the study of light, which travels one hundred and eighty-six thousand miles a second; should therefore some celestial spirit, moving with the rapidity of thought, desire to take a photographic picture, and witness the battle of Waterloo, he could even now accomplish it, by going to some remote star, where the image of the battle is just flashing the news in approaching light. Thus in light itself; no mirage, history, or detail is lost. All the pictures of the panorama of things, in their minutest details, since the world began, are stored away in the immortal eternity of God. Suns, with human inhabited worlds, have faded from the heavens, gone out, before our sun and our world was born, whose rapidly traveling light, with the immortal mirage and history of their every detail, have not yet

reached us ; these stupendous mirage-volumes of all the past, belong to God and to eternity.

Viewing the infinite sea of principles, symbolizing immortality, who can believe in the annihilation of even these simple, finite feelings — human thoughts? They are a part of the universe with God eternal.

If a drop of water and a ray of sunlight will create a rainbow in the sky ; if the force of a pebble dropped into the sea goes radiating into infinite circles ; if a song breathed into the air wakes the echoes of all the landscape, carried by the telephones of space, or locked in the phonographs of nature, for future and infinite reproduction, how impossible death ! how defeated the grave !

Even as the physical nerves of sensation, life, and thought all center at a small point in the *medulla oblongata* of this brain (where materialists have located the microscopic soul of man) ; but the circumference of this point is not the circumference of man ; nor is the measure of this human corruption, with these organs and limbs, the measure of man. Man is a broad, wide being, a deep, high being ; as high and as low, as broad and as full, as the sweep of his thoughts ; as pure and as vile as the gleams of love and hate which fill his soul and into which he radiates.

In a former chapter we have shown that "matter is thought;" that "thought and the thing thought of [using the language of Hegle] are identical;" that this physical universe is an emanation from mind — it is God's thought, existing as the abstract elements of his attributes, and as reflected emanations in the minds of his concrete, transient spirits.

This human flesh (a mortal coil chaining mind to matter, heaven to hell), cannot now raise itself beyond

the leaden strata between the deeps of rock and fire and the heights of air and sky.

Who knows but what these eternal fires upon which we tread are hissing caldrons of thought and passion? Who knows but what these eternal strata of upper ether (to whose existence our air is fire and poison), are the abode of consciousness and love, of which human nature sometimes catches a gleam in visions and in dreams, whereby heaven sometimes dips down into hell, as it did eighteen hundred years ago,

> In the person of that Crucifixion, Resurrection, and Glory,
> And talked to insect man, in words deep with meaning?

Who knows but what these endless gradations of elements, strata resting upon strata from molten rock to ethereal sky, are the garbs of eternal thought and being where chained to their spheres? God's feeling, sentient beings reign and live; from devils to man, from man to angels, from angels to glory.

What human mind can take in and comprehend this Milky Way of stars — this infinite chain of thought and being, — with their eternal evolutions of birth and death mingling and separating, sifting out heaven and hell; this ladder which Jacob saw reaching from earth to sky, from deepest hell to highest heaven, upon which myriad beings came and went?

What though the earth grow old and die! what though worlds and systems of worlds crumble together into a seething mass of affinities and repulsions, of loves and hates! Thought and passion, volition and feeling, the abstract attributes and conscious principles of the universe, are eternal. Sleep cannot destroy, and death cannot an-

"Human Nature Sometimes Catches a Gleam in Visions and in Dreams."

nihilate. Worlds and systems of worlds will come again ; and on their bosoms will be gathered together a higher life, a deeper love, a wider vision, and a grander glory.

Man is a sleeping somnambulist on the couch
Of God's throne, dreaming the wondrous dream of life,—
A sleep-walker on the earth,— a ticket-of-leave
From God's eternity ! In the happy bliss of
The ancient heaven, amid the music of spheres,
He fell into the sleep of the earthly dreams,
And forgets the past. Slumbering for a moment,
Since the sun began, till the world is finished,
He dreams the story of human history,
In which with fevered brain, and hot, breathless passion,
He is an actor in the play of vice and virtue,
And the surging, changing drama of life and death.
In death and dissolving worlds, when the trump shall sound,
He will awake from transient, momentary sleep,
Calling him back from dreams to vaster spheres,
As self-existent in God he lives eternal ; —
A fire of metamorphic, scintillating colors,
Indestructible, uncreated by heaven or hell —
Whether reposing in the cradle of nature,
Mixing with the mighty universe of suns,
Or, anon, the feeling king of a human skull ; —
Bursting the shell of clay, delivered from the womb
Of nature, from the mortal, finite universe,
He will awake from dreams to other spheres,
From the probationary test and school of life,
By evil assimilation to a paradise lost,
Or exalted in virtue to a paradise regained '

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